ALAGAPPA UNIVERSITY

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M.A. [Education]

IV - Semester

348 83

ICT IN EDUCATION

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SYLLABI-BOOK MAPPING TABLE

ICT in Education

UNIT-X: ICT for Teaching Learning
Appreciate the potential of ICT in Education, specifically in teaching and learning. Releasing the importance of learner analysis and classroom analysis. Analyzing curriculum to identify areas for ICT infusion. Determining the ICT resources for teaching-learning.

UNIT-XI : Internet
Concept and types of network. Internet and internet tools.Introduction to Search Engines (Google, Yahoo, Bing, etc.) and Email. Blogging and its use in teaching.

BLOCK - IV: SOCIAL NETWORKS, E-LEARNING AND DIGITAL STORY TELLING

UNIT-XII: Social Networks
Facebook Whatsapp Twitter, Skype, etc., Mobile learning.Their Educational Uses.

UNIT-XIII: E-Learning
Concept of e-learning, its trends, attributes and opportunities. Management and implementation of e-learning.E-Book and E-Magazine, Electronic Journals and E-Readers, E-Coaching, E-Tutorial and E-Moderation.The E-Journals in the field of Educational Technology Ethical Issues in Educational Technology

UNIT-XIV: Digital Storytelling
Combining text, graphic and audio visuals to create a communication. Developing a story and scripting by combining multiple digital media. Developing digital stories for communication in classrooms. Evaluating digital stories. Exploring possibilities for inclusive using digital story telling.

CONTENTS

BLOCK I
MODERN, TRENDS, RESOURCE CENTERS, EDUCATIONAL COMMUNICATION TECHNOLOGY

UNIT 1 MODERN TECHNOLOGIES IN EDUCATION

Structure

1.1 INTRODUCTION

A computer is a programmable machine designed to perform arithmetic and logical operations automatically and sequentially on the input given by the user and gives the desired output after processing. Computer components are divided into two major categories namely hardware and software. Hardware is the machine itself and its connected devices such as monitor, keyboard, mouse etc. Software are the set of programs that make use of hardware for performing various functions.

1.2 OBJECTIVES

After going through this unit, you would be able to:

• explain characteristics of computers

• identify the basic component of a computer

• explain the importance of various units of a computer

• differentiate between system software and application software

• explain the importance of operating system

• get acquainted with open source

• appreciate the need of computer security.

1.3 BASIC CONCEPTS OF COMPUTER

A computer system is a combination of hardware and software. The physical and tangible parts/components of a computer that can be seen and touched are known as Hardware. When one looks at the computer system, he/she is actually looking at the computer hardware. The hardware consists of the physical components of a computer system like input devices (keyboard, mouse, scanner, etc.), output devices (monitor, printer, speaker, etc.), a processing device (CPU) and the storage device (Compact disk, hard disk, DVDs, etc.).
Software represents the set of programs and instructions that govern the operation of a computer system. A computer system cannot do anything on its own. It must be instructed to perform a specific task and therefore, to solve a problem the user has to specify the sequence of instructions which a computer must follow. Such a sequence of instructions is called the program and is written in a language understood by the computer.

1.4 TYPES OF COMPUTER

There are Four Different Computer Types-

We have four different computer types classified according to their performance, power, and size. A computer is an electronic device that accepts data, processes it, stores, and then produces an output.

There are different computer types available depending on the number of users they can support at any one time, their size, and power. In this hub, we are going to have a look at the difference between supercomputers, mainframe, mini, and microcomputers.

1. **Supercomputers**

   Supercomputers are very expensive, very fast, and the most powerful computers we have in the world.

   Supercomputers are optimized to execute a few numbers of programs. This makes it possible for them to execute these few programs at a very high speed. Due to their inhibiting cost, they are used in high-end places like in scientific research centres. The supercomputer consists of thousands of processors making it clock very high speeds measured by pet flops.

   These computer types are also very large in size due to the numerous parts and components involved in their design.

A good example of a Supercomputer is Tianhe-2: TH-IVB-FEP Cluster; National Super Computer Centre in Guangzhou, China; 3.12 million cores (33.86 pet flops/s).

2. **Mainframe computers**

These are large and expensive computer types capable of supporting hundreds, or even thousands, of users simultaneously. Thus, they are mostly used by governments and large organizations for bulk data processing, critical applications, transaction processing, census, industry and consumer statistics among others. They are ranked below supercomputers.

3. **Minicomputers**

Minicomputers are mid-sized computers. In terms of size and power, minicomputers are ranked below mainframes. A minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

The use of the term Minicomputer has diminished and they have merged with servers.

4. **Microcomputers or Personal computers**

A personal computer is a computer designed to be used by one user at a time. The term microcomputer relates to the microprocessor which is used with a personal computer for the purpose of processing data and instruction codes. These are the most common computer types since they are not very expensive.

1.4.1 Components of Computers

Any computer has the following essential components:

i) Input Devices

ii) Central Processing Unit (CPU)

a) Arithmetic and Logic Unit

b) Control Unit

c) Memory Unit and

d) Registers

iii) Output Devices.

The following block diagram shows the fundamental components of a digital computer.

Input devices:

Control Unit Arithmetic &
Logic Unit Input Unit Output Unit

Memory Unit
Auxiliary Storage Unit

They are the tools through which one can feed the data into the computer. In other words, an input device will be the medium through which one can communicate with the computer. There are so many input devices available for a computer. The most common input devices are as follows: Keyboard; Mouse; Light Pen; Track Ball; Track Pad; Joy Stick;
Touch Screen. Alternate Input Devices are as follows: Optical Mark Reading and Recognition (OMR); Optical Character Recognition (OCR); Magnetic Ink Character Recognition (MICR), Bar coding, Scanner (Flatbed Scanner, Overhead Scanner, Hand Held Scanner); Speech Input Unit and Graphics Tablet.

Central Processing Unit (CPU):

It is considered to be the heart of the computer system, which consists of

a) Arithmetic and Logic Unit,

b) Control Unit,

c) Memory unit and

d) Registers.

The CPU executes the instructions as soon as the computer gets instructions from an input device.

• **Arithmetic and Logic Unit (ALU):**

This unit performs a number of arithmetic operations such as, addition, subtraction etc. and also performs the logical operations.

• **Control Unit:**

The Control unit controls the entire operations of all the units of a computer. It brings one instruction at a time from the memory, interprets it and obeys it by coordinating the working of all the others units. In other words, this unit is considered to be the nervous system of a computer. All the commands are regulated and controlled by this unit.

• **Memory Unit:**

This unit consists of locations or cells on which the data can be stored. This unit consists of two types of memories viz., Permanent memory and secondary or auxiliary memory. A permanent memory is nothing but the semiconductor memory device available within the computer. Hard disk is an example of permanent memory device. The secondary memory is the memory which is movable and can be taken away from the computer and can be kept safely.

• **Registers:**

They are used to store data and information for future application and uses.

Output Devices:

The output devices are the devices through which a computer gives the results, which can be in the form of graphs, or tables, or printed reports. The commonly available output units are

i) a monitor or TV screen, also called a Visual Display Unit (VDU),

(ii) a printer

iii) a plotter and

iv) speaker.

1.5 OPERATING SYSTEM COMPONENTS

An operating system provides the environment within which programs are executed. To construct such an environment, the system is partitioned into small modules with a well-defined interface. The design of a new operating system is a major task. It is very important that the goals of the system be will defined before the design begins. The type of system desired is the foundation for choices between various algorithms and strategies that will be necessary.

A system as large and complex as an operating system can only be created by partitioning it into smaller pieces. Each of these pieces should be a well defined portion of the system with carefully defined inputs, outputs, and function. Obviously, not all systems have the same structure. However, many modern operating systems share the system components outlined below.

1.5.1 Process Management

The CPU executes a large number of programs. While its main concern is the execution of user programs, the CPU is also needed for other system activities. These activities are called processes. A process is a program in execution. Typically, a batch job is a process. A time-shared user program is a process. A system task, such as spooling, is also a process. For now, a process may be considered as a job or a time-shared program, but the concept is actually more general.

In general, a process will need certain resources such as CPU time, memory, files, I/O devices, etc., to accomplish its task. These resources are given to the process when it is created. In addition to the various physical and logical resources that a process obtains when its is created, some initialization data (input) may be passed along. For example, a process whose function is to display on the screen of a terminal the status of a file, say F1, will get as an input the name of the file F1 and execute the appropriate program to obtain the desired information.
We emphasize that a program by itself is not a process; a program is a passive entity, while a process is an active entity. It is known that two processes may be associated with the same program, they are nevertheless considered two separate execution sequences.

A process is the unit of work in a system. Such a system consists of a collection of processes, some of which are operating system processes, those that execute system code, and the rest being user processes, those that execute user code. All of those processes can potentially execute concurrently.
The operating system is responsible for the following activities in connection with processes managed.

- ❖ The creation and deletion of both user and system processes
- ❖ The suspension are resumption of processes.
- ❖ The provision of mechanisms for process synchronization
- ❖ The provision of mechanisms for deadlock handling.

1.5.2 Memory Management

Memory is central to the operation of a modern computer system. Memory is a large array of words or bytes, each with its own address. Interaction is achieved through a sequence of reads or writes of specific memory address. The CPU fetches from and stores in memory.

In order for a program to be executed it must be mapped to absolute addresses and loaded in to memory. As the program executes, it accesses program instructions and data from memory by generating these absolute is declared available, and the next program may be loaded and executed.
In order to improve both the utilization of CPU and the speed of the computer's response to its users, several processes must be kept in memory. There are many different algorithms depends on the particular situation. Selection of a memory management scheme for a specific system depends upon many factor, but especially upon the hardware design of the system. Each algorithm requires its own hardware support.

- o The operating system is responsible for the following activities in connection with memory management.
- o Keep track of which parts of memory are currently being used and by whom.
- o Decide which processes are to be loaded into memory when memory space becomes available.
- o Allocate and deallocate memory space as needed.

1.5.3 Secondary Storage Management

The main purpose of a computer system is to execute programs. These programs, together with the data they access, must be in main memory during execution. Since the main memory is too small to permanently accommodate all data and program, the computer system must provide secondary storage to backup main memory. Most modem computer systems use disks as the primary on-line storage of information, of both programs and data. Most programs, like compilers, assemblers, sort routines, editors, formatters, and so on, are stored on the disk until loaded into memory, and then use the disk as both the source and destination of

their processing. Hence the proper management of disk storage is of central importance to a computer system.

There are few alternatives. Magnetic tape systems are generally too slow. In addition, they are limited to sequential access. Thus tapes are more suited for storing infrequently used files, where speed is not a primary concern.

The operating system is responsible for the following activities in connection with disk management

Free space management

Storage allocation

Disk scheduling.

1.5.4 I/O System

One of the purposes of an operating system is to hide the peculiarities of specific hardware devices from the user. For example, in Unix, the peculiarities of I/O devices are hidden from the bulk of the operating system itself by the I/O system. The I/O system consists of:

A buffer caching system

A general device driver code

Drivers for specific hardware devices.

Only the device driver knows the peculiarities of a specific device.

1.5.5 File Management

File management is one of the most visible services of an operating system. Computers can store information in several different physical forms; magnetic tape, disk, and drum are the most common forms. Each of these devices has it own characteristics and physical organization.

For convenient use of the computer system, the operating system provides a uniform logical view of information storage. The operating system abstracts from the physical properties of its storage devices to define a logical storage unit, the file. Files are mapped, by the operating system, onto physical devices.

A file is a collection of related information defined by its creator. Commonly, files represent programs (both source and object forms) and data. Data files may be numeric, alphabetic or alphanumeric. Files may be free-form, such as text files, or may be rigidly formatted. In general a files is a sequence of bits, bytes, lines or records whose meaning is defined by its creator and user. It is a very general concept.

The operating system implements the abstract concept of the file by managing mass storage device, such as types and disks. Also files are normally organized into directories to ease their use. Finally, when multiple users have access to files, it may be desirable to control by whom and in what ways files may be accessed.

- The operating system is responsible for the following activities in connection with file management:
- The creation and deletion of files
- The creation and deletion of directory
- The support of primitives for manipulating files and directories

- The mapping of files onto disk storage.
- Backup of files on stable (non volatile) storage.

1.5.6 Protection System

The various processes in an operating system must be protected from each others activities. For that purpose, various mechanisms which can be used to ensure that the files, memory segment, cpu and other resources can be operated on only by those processes that have gained proper authorization from the operating system.

For example, memory addressing hardware ensure that a process can only execute within its own address space. The timer ensure that no process can gain control of the CPU without relinquishing it. Finally, no process is allowed to do its own I/O, to protect the integrity of the various peripheral devices.

Protection refers to a mechanism for controlling the access of programs, processes, or users to the resources defined by a computer controls to be imposed, together with some means of enforcement.

Protection can improve reliability by detecting latent errors at the interfaces between component subsystems. Early detection of interface errors can often prevent contamination of a healthy subsystem by a subsystem that is malfunctioning. An unprotected resource cannot defend against use (or misuse) by an unauthorized or incompetent user.

1.5.7 Networking

A distributed system is a collection of processors that do not share memory or a clock. Instead, each processor has its own local memory, and the processors communicate with each other through various communication lines, such as high speed buses or telephone lines. Distributed systems vary in size and function. They may involve microprocessors, workstations, minicomputers, and large general purpose computer systems.

The processors in the system are connected through a communication network, which can be configured in the number of different ways. The network may be fully or partially connected. The communication network design must consider routing and connection strategies, and the problems of connection and security.

A distributed system provides the user with access to the various resources the system maintains. Access to a shared resource allows computation speed-up, data availability, and reliability.

1.5.8 Command Interpreter System

One of the most important component of an operating system is its command interpreter. The command interpreter is the primary interface between the user and the rest of the system.

Many commands are given to the operating system by control statements. When a new job is started in a batch system or when a user logs-in to a time-shared system, a program which reads and interprets control statements is automatically executed. This program is variously called

(1) the control card interpreter,

(2) the command line interpreter,

(3) the shell (in Unix), and so on. Its function is quite simple: get the next command statement, and execute it.

The command statement themselves deal with process management, I/O handling, secondary storage management, main memory management, file system access, protection, and networking.

1.6 APPLICATION OF COMPUTER IN THE FIELD OF EDUCATION AND EVALUATION

Computers in Education:

Computers are helping the teachers in the following areas:

(1) Classification of pupils:

Computers help in classification of children according to their abilities and evaluating their performance.

(2) Preparing time-table:

Computers help in preparing time-table, schedules, etc.

(3) Maintenance of progress cards:

Computers maintain progress cards and preserve them efficiently and confidentially.

(4) Tutorial and dialogue:

Computer can play effectively the role of the tutor. It helps the teacher in engaging students in tutorial work. There is tutorial interaction and dialogue.

(5) Immediate feedback:

Computers helps the teacher in providing immediate feed back to students for better interaction and motivation.

(6) Problem-solving and creativity:

Computers can be used to develop Problem-solving ability and creativity among the students.

(7) Laboratory and practical work:

Computers can supplement laboratory and practical work especially in science and technology subject.

(8) Training through stimulate techniques:

The computer can be used to give training to the students through stimulated and gaming techniques.

(9) Education to handicapped:

Computers can be used in providing education to handicapped like deaf and dumb.

(10) Repetition:

A lesson if not understood once can be repeated number of times and thoroughly understood by even an average student. Computer can work according to the tune of the student.

(11) Guidance:

Computer helps the teacher in providing information/data for guidance and reference.

Computer can be an excellent teacher. It can impart knowledge without losing temper and getting impatient. It is enjoyable and can have audio-visual facilities.

1.7 Computer Assisted Instruction

In these computer assisted instructions, is interacts directly with the learners while presenting lessons. The computer delivers instructions directly to students and permits them to interact with the computer through the lessons programmed in the system. There are various instructional modes which can be facilitating by programmed instructions.

1. Tutorial Mode:

In tutorial, information is presented in small units followed by a question. The pupils' response is analysed by the computer and appropriate feedback is given. A network of branches or pathways can be programmed to teach. The pupils are allowed to work on their own pace. The more alternative programmes available to the computers, the more adaptive the tutorial can be to individual differences.

2. Drill or Practice:

In this mode, the programme leads the learner through a series of examples to develop dexterity and fluency in using the skill. All correct responses are reinforced. Only on achieving the mastery by the learner, the computer will proceed further.

3. Discovery Mode:

Here, inductive approach is followed. The problems are presented and the pupil solves those problems through trial and error. It is just like laboratory learning. It aims at the deeper understanding of the results obtained from discovery. Hence, complex problems can be solved.

4. Gaming Mode:

This mode may or may not be instructional, but it is recreational. Sometimes learning takes place through games. This mode is especially meant for young children.

5. Simulation Mode:

Here the pupil faces scaled down approximation of real life situations. 0Hence, realistic practice takes place without involving any risk.

6. Problem Solving Mode:

Problem solving can be readily achieved provided the typical computational capability of the computer is available and there is a typewriter and display response device with remote control of two-way communication. The students need to know how to communicate with computer and how to solve his problem.

1.8 MS Word: Introduction

There are many software packages to do the job of word processing. Some of them work in DOS environment. Example are WordStar, Word Perfect and Professional Write. But in these days working in WINDOWS is becoming more and more popular. So let us consider software for word processing which works in WINDOWS. Our choice is MS-WORD because it is the most popular software in these days. MS-WORD is a part of the bigger package called MS OFFICE, which can do much more than word processing. In fact when you open up MS OFFICE you will find four main components in it. They are MS-WORD (for word processing), MS EXCEL (for spreadsheet), MS ACCESS (for database management) and MS POWERPOINT (for presentation purposes). However, we will limit ourselves to MS-WORD only in this section.

MS Word is the most popular word processing software used today. A word processor is essentially a computerized version of the standard typewriter. However, the computer adds features typewriters never dreamed of having like spell check, the ability to save and store documents, copy and paste functions, the ability to add images and shapes to documents, and many more. When attached to an email, electronic documents, created by MS Word can be delivered in seconds. Another benefit is that it helps the user to type faster and more accurate.

1.8.1Concept and uses of M.S. word

Word Processor is a software package that enables you to create, edit, print and save documents for future retrieval and reference. Creating a document involves typing by using a keyboard and saving it. Editing a document involves correcting the spelling mistakes, if any, deleting or moving words sentences or paragraphs. Word processor (more formally known as document preparation system) is a computer application used for the production (including composition, editing, formatting, and possibly printing) of any sort of printable material. Word processor may also refer to a type of stand-alone office machine, popular in the 1970s and 1980s, combining the keyboard text-entry and printing functions of an electric typewriter with a dedicated processor (like a computer processor) for the editing of text. Although features and design varied between manufacturers and models, with new features added as technology advanced, word processors for several years usually featured a monochrome display and the ability to save documents on memory cards or diskettes. Later models introduced innovations such as spell-checking programs, increased formatting options, and dot-matrix printing. As the more versatile combination of a personal computer and separate printer became commonplace, most business-machine companies stopped manufacturing the word processor as a stand-alone office machine. Word processors are descended from early text

formatting tools (sometimes called text justification tools, from their only real capability). Word processing was one of the earliest applications for the personal computer in office productivity.

Uses of M.S. Word

Many organisations now use computers to produce and organise written material, correspondence, membership lists and so on. This guide deals with the most common programme, MSWORD, that is used on most computers. It is written for people who have not used the programme before and has very basic information about the keyboard and MSWORD. If you have taught yourself to use MSWORD, it may also be useful to you.

Your MSWORD programme is called a word-processing package. This means that it is useful for typing and storing letters, articles and anything that consists mainly of words. It is basically a fancy typewriter with a built in filing-system.

The more you use your computer the more you will learn about what it can do. This guide contains a few basic things to help you get started.

If you have not used a computer much, print the next section out and look at your keyboard and MSWORD programme with it. Try to do everything as you read it.

Features of Word Processing

Most Word Processor available today allows more than just creating and editing documents. They have wide range of other tools and functions, which are used in formatting the documents. The following are the main features of a Word Processor

- Text is typing into the computer, which allows alterations to be made easily.
- Words and sentences can be inserted, amended or deleted.
- Paragraphs or text can be copied /moved throughout the document.
- Margins and page length can be adjusted as desired.
- Spelling can be checked and modified through the spell check facility.
- Multiple document/files can be merged.
- Multiple copies of letters can be generated with different addresses through the mail- merge facility.

Parts of the MS Word Screen

Microsoft Word is a word processing program that allows for the creation of both simple and sophisticated documents. The program is equipped with templates and wizards to help you create useful documents such as resumes, letters and fax cover sheets. The following are the parts of MS word Screen

Parts	Function
Title Bar	It displays the program name, and the name of curre document displayed or being edited.
Menu Bar	It contains the names of the command menus curren available.
Standard Toolbar	It contains buttons that provide shortcuts for the mo commonly used Word Features, such as opening a printing document.
Formatting Toolbar	It contains buttons and drop-down lists that you use modify the appearance of selected text.
Ruler	It shows the width of your text, as well as any indents tabs.
Document Window	It displays the documents you create and edit.
Insertion Point	It is a blinking vertical line at the upper left corner of a ne document.
End mark	It indicates the end of the document.
Scroll Bars	It is one of the main ways to navigate through a docume Appear along the right side and bottom edges of t document window. Each scroll bar contains two scr arrows and scroll box, which you can use to mo vertically and horizontally through a document.
Status Bar	It displays the necessary information about the acti document such as page.
Minimize Button	It is used to temporary hide word (to shrink it to an icon the taskbar).
Maximize Button	It is used to enlarge MS-Word to full screen.
Close Button	It is used to exit or quit MS-Word.

Working with a Document / Using a Document

MS-Word is used by people with widely varying levels of skill and experience, and there are often several different ways to do some tasks. Most commands are available through the Menu and sub menus. For frequently used commands, there are often iconic shortcut buttons on

the Tool bars that can be selected with the mouse. For people with better keyboard skills or experience, there are keyboard shortcuts, often using the Control (CTRL), Shift (SHFT) or Alternate (ALT) keys on the PC and Command or Option keys of the Macintosh. Creating a New Document Choose File and then New from the menu bar (This may ask you to select which document template to use for the new document.)

- Click the New Blank Document button of the toolbar
- Press CTRL + N on the keyboard. (Depress and hold CTRL, Press and release 'N')

Opening an Existing Document

- Choose File and then Open from the menu bar.
- Click the Open button on thetoolbar.
- Press CTRL + O on the keyboard.

Each method will show the Open dialog box. Select the drive the file was saved on, choose the file, and click the Open button.

Saving a Document

- Select File Save from the menu bar.
- Click the Save button on the toolbar.
- Press CTRL + S on the keyboard.

Navigate to the location where you would like to save the document. Make a note of the drive where the document is saved for future reference. To save an existing open document under a different name, select 'File Save As'

1.10 MSPOWERPOINT

MS PowerPoint is the presentation software used to create slides, handouts and speaker notes. PowerPoint helps the user to prepare, update and order slide-based presentation material quickly. Slide means one page of power point presentation. The slide size can be set to the size of transparent sheet, a 35 mm film or the actual computer screen. The slides prepared can be printed on plain paper or on transparent sheet and displayed on computer screen, multimedia projector or through film projector. Power Point presentation has a sequence of slides and each slide may contain objects such as text, picture, chart, table and other types of multimedia elements. Slides can have title text and body text. The title text provides title for each slide and body text consists of a series of main and sub-points referred by bullets.

Features of Power Point Presentation

PowerPoint incorporates the following features which make its superior to the other presentation methods.

Slider Transition:

A transition is how PowerPoint gets from one slide to the next slide during presentation. The usual method of removing the previous slide and putting the next one is very boring. Power-Point enables the

user to assign 45 different special effects to each slide transition. For example by mouse click or automatic time setting, the slides can be displayed one by one. Moreover, if any part of the slide is to be hidden temporarily, provisions are available to perform such things.

Color Schemes and Fonts: PowerPoint supports colour schemes and fonts. User can select a pre-designed color or form a new color scheme as he desires by picking from among the 16 million colors. In addition, different colors can be set for each object like Title Text, Body Text, and Background etc.

PowerPoint enables the user to project individual characters in different ways. It supports all the MS Word font styles and font sizes. Using them, the user can dress up his presentation materials and make the text appear in different styles.

Auto Layout and Masters: PowerPoint has a number of Auto Layout choices of common slide making tasks. These layouts have text boxes, places to insert pictures, bullet list, formatting and so on. Auto Layout takes care of things like margin, line spacing etc. Auto Layout helps the user to design each slide effectively in an easier manner. Masters specify common design elements that the user wishes to include throughout his presentation. PowerPoint comes with a variety of predefined masters and they contain elements like backgrounds, font choices, color schemes, logos etc.

Adding Pictures: PowerPoint is well equipped to add all sorts of pictures like clip art, drawings, graphs, and charts. Power point comes with more than 1000 clip art pictures that the user can take directly add into his presentation. Common graphics operations like moving, sizing, shading, boxing and stretching can be applied on these pictures. Other photo images and scanned images can also be included into slides if the user wants.

Adding Charts:

Power point enables the user to illustrate a point with a chart (e.g. . Bar Chart, Pie Chart etc.,). The graph, which works within Power Point, helps the user to create and edit a Chart. These charts can be added into a slide by choosing the appropriate slide layouts. There are 14 basic types of chart. The chart type can be changed at any time without changing the chart data.

Drawing on Slides:

Drawing is a tedious work and it consumes a lot of time. Power Point has powerful tools for drawing basic shapes such as line, circle, arc, square etc.

Equation, Word Art and other Add-ons:

For mathematical work, Power point comes with an equation editor. The Word Art program of MS Word can be used from PowerPoint, which transforms an ordinary text into text arts. In addition tree like charts

(hierarchical chart) and Microsoft Excel worksheets can be easily added into PowerPoint slides to make more efficient presentation.

Adding Multimedia Effects: Multimedia effects like sound, animated picture and video clips can be inserted into PowerPoint slides.

Other Common Windows Features:

PowerPoint is a window application software and supports all common Windows Features like; Graphical User Interface, Keyboard and Mouse Operation, Special Character, MS Word Editing features like cut, paste, etc and Dialog Boxers and Message Boxes

Thus, PowerPoint is user friendly presentation software which helps to design presentation material beautifully even if the user is not an art designer.

Creating a Presentation

Microsoft PowerPoint is a powerful tool to create professional looking presentations and slide shows. PowerPoint allows you to construct presentations from scratch or by using the easy to use wizard.

Starting Microsoft PowerPoint

- Two Ways
  1. Double click on the Microsoft PowerPoint icon on the desktop.
  2. Click on Start -- Programs -- Microsoft Power Point

Creating & Opening a Presentation

After you open up Microsoft PowerPoint, a screen pops up asking if you would like to create a New Presentation or Open an Existing Presentation.

- **Auto Content Wizard**
  - Creates a new presentation by prompting you for information about content, purpose, style, handouts, and output. The new presentation contains sample text that you can replace with your own information. Simply follow the directions and prompts that are given by Microsoft PowerPoint.
- **Design Template**
  - Creates a new presentation based on one of the PowerPoint design templates supplied by Microsoft. Use what is already supplied by Microsoft PowerPoint and change the information to your own.
- **Blank Presentation**
  - Creates a new, blank presentation using the default settings for text and colors.

Opening an Existing Presentation

1. Select Open An Existing Presentation.
2. Click on your presentation in the white box below step1
   - If you do not see your presentation in the white box, select More Files and hit OK.
   - Locate you existing Presentation and hit the Open button

Manipulation and Presentation of Slides

- Inserting a new slide
  1. Click Insert at top of screen
  2. Select New Slide
- Formatting a slide background:
  1. Click Format at the top of the screen
  2. Select Apply Design Template
  3. Select Design you wish to apply
  4. Click Apply Button
- Inserting Clipart &Pictures

Display the slide you want to add a picture to.

1. Click Insert at the top of the screen
2. Select Picture
3. Select ClipArt
4. Click the category you want
5. Click the picture you want
6. Click Insert Clip on the shortcut men
7. When you are finished using the Clip Gallery, click the Close button on the Clip Gallery title bar
8. Steps 1-4 are very similar when inserting other Pictures, Objects, Movies, Sounds, and Charts

Power Point Presentation as a Method of Teaching

Teacher can use the Power point Presentation is a tool, as an audio/visual aid and as a technique for promoting learning in the classroom. While planning for teaching with MS PowerPoint, should be kept in the mind the following:

(i) Selection:

A Teacher can select the power point slide in the following manner

- The slide should be attractive to the students.
- The slide should be made according to the teacher and the student's interaction.

- The slide should be explaining the concept of lesson in clearly.

(ii) Preview:

- The teacher should see the slides before the presentation.
- The teacher should to know whether the students able to understand the slides.
- If the teacher has a workbook for the lesson, then he/she should read the explanation about the topic before going to the presentation.
- The teacher should see the slides before the presentation and must prepare for motivating the students.
- The teacher should give the related assignment tasks to the student before presenting the lesson.

(iii) Preparation:

- The teacher should know the audience, equipment, and presentation room.
- The teacher should give the small introduction about lesson and then start the presentation

(iv) Presentation:

- The teacher should correct the equipment (like LCD, computer) and display the picture presentation clearly.
- The teacher should interact with the student in the middle of the Presentation.
- The teacher should display the slides in the sequential order.
- If it is necessary to take the notes. The teacher should allow the students to take the notes, during presentation.
  The teacher should not simply read from the slides.

Advantages of Power point Presentation:

Power point is best suited for

- Organizing and reorganizing information efficiently so that students see the structure of a classroom teaching session.
- Providing more time for listening and comprehending so that class time is used effectively
- Illustrating concepts with pictures and other multimedia
- Merging text, graphics, sound, multimedia, offering control and visual dynamics

- Allowing the teacher easily to modify/enhance slides and lecture notes
- Allowing the teacher to face the students (rather than facing the blackboard)

Presenting outlines of information in a sequential manner

Renaming a Document

To rename an existing, but not open, Word document while using the program:

- Select File Open (or press CTRL + O on the keyboard) and find the file you want to rename.
- Right-click on the document name with the mouse and select Rename form the shortcut menu.
- Type the new name for the file and press the ENTER key.

Closing a Document

- Selecting File Close from the menu bar
- Click the close window icon if it's visible on the menu bar
- Press CTRL + W or CTRL + F4 on the keyboard.

Exiting Word

- Choose the File Exit on the menu bar.
- Click the Close button align with the title bar.
- Press ALT + F4 on the Keyboard.

1.9 MICROSOFT EXCEL

Microsoft had been developing Excel on the Macintosh platform for several years at this point, where it had developed into a fairly powerful system. A port of Excel to Windows 2.0 resulted in a fully functional Windows spreadsheet. The more robust Windows 3.x platforms of the early 1990s made it possible for Excel to take market share from Lotus. Starting in the mid 1990s continuing through the present, Microsoft Excel has dominated the commercial electronic spreadsheet market.

Worksheet/ Spread Sheet

A spreadsheet is a sheet of paper that shows accounting or other data in rows and columns; a spreadsheet is also a computer application program that simulates a physical spreadsheet by capturing, displaying, and manipulating data arranged in rows and columns. The spreadsheet is one of the most popular uses of the personal computer. In a spreadsheet, spaces that hold items of data are called cells. Each cell is labeled according to its placement (for example, A1, A2, A3...) and may have an absolute or relative reference to the cells around it. A spreadsheet is generally designed to hold numerical data and short text strings. Spreadsheets usually provide the ability to portray data relationships graphically. Spreadsheets generally do not offer the ability to structure and label data items as fully as a database and usually do not offer the

ability to query the database. In general, a spreadsheet is a much simpler program than a database program.

Daniel Bricklin and Bob Frankston created the first spreadsheet application, VisiCalc (for "visible calculator"). Lotus 1-2-3 came next, followed by Microsoft Excel. While Lotus 1-2-3 was the first to introduce cell names and macros, Microsoft Excel implemented a graphical user interface and the ability to point and click using a mouse. There are many other spreadsheet applications on the market today; however, Lotus 1-2-3 and Microsoft Excel continue to be the mostpopular.

Features of spread sheet

The following are some of the features of spread sheet

Cells:

A "cell" can be thought of as a box for holding a datum. A single cell is usually referenced by its column and row. Usually rows are referenced in decimal notation starting from 1, while columns use 26-adic bijective numeration using the letters A-Z as numerals. Its physical size can usually be tailored for its content by dragging its height or width at box intersections (or for entire columns or rows by dragging the column or rows headers). An array of cells is called a "sheet" or "worksheet".

Values:

A value can be entered from the computer keyboard by directly typing into the cell itself. Alternatively, a value can be based on a formula (see below), which might perform a calculation, display the current date or time, or retrieve external data such as a stock quote or a database value. The Spreadsheet Value Rule Computer scientist Alan Kay used the term value rule to summarize a spreadsheet's operation: a cell's value relies solely on the formula the user has typed into the cell.

Automatic recalculation: A standard of spreadsheets since the middle 80s, this optional feature eliminates the need to manually request the spreadsheet program to recalculate values (nowadays typically the default option unless specifically 'switched off' for large spreadsheets, usually to improve performance). Some earlier spreadsheets required a manual request to recalculate, since recalculation of large or complex spreadsheets often reduced data entry speed. Many modern spreadsheets still retain this option.

Real-time update:

This feature refers to updating a cell's contents periodically when its value is derived from an external source - such as a cell in another "remote" spreadsheet. For shared, web-based spreadsheets, it applies to "immediately" updating cells that have been altered by another user. All dependent cells have to be updated also.

Locked cell:

Once entered, selected cells (or the entire spreadsheet) can optionally be

"locked" to prevent accidental overwriting. Typically this would apply to cells containing formulas but might be applicable to cells containing "constants" such as a kilogram/pounds conversion factor (2.20462262 to eight decimal places). Even though individual cells are marked as locked, the spreadsheet data is not protected until the feature is activated in the file preferences.

Data format:

A cell or range can optionally be defined to specify how the value is displayed. The default display format is usually set by its initial content if not specifically previously set, so that for example "31/12/2007" or "31 Jan 2007" would default to the cell format of "date". Similarly adding a % sign after a numeric value would tag the cell as a percentage cell format. The cell contents are not changed by this format, only the displayed value.

Cell formatting:

Depending on the capability of the spreadsheet application, each cell (like its counterpart the "style" in a word processor) can be separately formatted using the attributes of either the content (font size, color, bold or italic) or the cell (border thickness, background shading, and color). To aid the readability of a spreadsheet, cell formatting may be conditionally applied to data - for example, a negative number may be displayed in red.

Cell reference: In place of a named cell, an alternative approach is to use a cell (or grid) reference. Most cell references indicate another cell in the same spreadsheet, but a cell reference can also refer to a cell in a different sheet within the same spreadsheet, or (depending on the implementation) to a cell in another spreadsheet entirely, or to a value from a remote application. A typical cell reference in "A1" style consists of one or two case- insensitive letters to identify the column (if there are up to 256 columns: A-Z and AA-IV) followed by a row number (e.g. in the range1-65536).

Cell ranges:

Likewise, instead of using a named range of cells, a range reference can be used. Reference to a range of cells is typically of the form (A1:A6) which specifies all the cells in the range A1 through to A6. A formula such as "=SUM (A1:A6)" would add all the cells specified and put the result in the cell containing the formula itself.

Sheets:

In the earliest spreadsheets, cells were a simple two-dimensional grid. Over time, the model has been expanded to include a third dimension, and in some cases a series of named grids, called sheets. The most advanced examples allow inversion and rotation operations which can slice and project the data set in various ways.

Formulas:

A formula identifies the calculation needed to place the result in the cell it is contained within. A cell containing a formula therefore has

two display components; the formula itself and the resulting value. The formula is normally only shown when the cell is selected by

"clicking" the mouse over a particular cell; otherwise it contains the result of the calculation.

Remote spreadsheet:

Whenever a reference is made to a cell or group of cells that are not located within the current physical spreadsheet file, it is considered as accessing a "remote" spreadsheet. The contents of the referenced cell may be accessed either on first reference with a manual update or more recently in the case of web based spreadsheets, as a near real time value with a specified automatic refresh interval.

Charts:

Many spreadsheet applications permit charts, graphs or histograms to be generated from specified groups of cells which are dynamically re-built as cell contents change. The generated graphic component can either be embedded within the current sheet or added as a separate object.

Applications of Spread Sheet

Spreadsheets are typically used by teachers to keep track of students' performance. The most well-known spreadsheets are Microsoft's Excel, Lotus 1-2-3 and WordPerfect's Quattro. Their use goes far beyond creating simple mark sheets as spreadsheets are complex programs offering a range of powerful features, including game programming, text effects, graphing and graphics capabilities.

Budget Planning: A spreadsheet is an excellent budget planning tool, with calculation features that make keeping track of expenses and income easy, and calculating end-of-year data a breeze. Every year the administrator should plan the budget through spreadsheet. Budget planning consists of staff's salary, expenses in building construction and purchasing library books.

Charts:

Spreadsheets include graphic capabilities that allow you to calculate and compile information into visual representations. This is a great way to keep track of an students passing record or any other information that needs to be tracked and calculated on a regular basis. Teacher can identify the student's level through chart application in spread sheet.

Database and Address Books: A spreadsheet can be a versatile database, keeping track of important web pages and names, numbers and addresses of students and staff contacts. It can even be used as a reference database for staffs. All the students' information is stored in spread sheet. It is very useful for communication purpose. Student's personal record also entered in to spreadsheet.

Surveys: One can use a spreadsheet to take surveys. The survey results can be easily entered and the calculation features can be used to analyze and sort the information.

Check Your Progress
Notes: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of the unit.

1. Define MICROSOFT EXCEL
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…………………………………………………………………………
…………………………………………………………………………
2. List the Features of Power Point Presentation?
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1.11 LET US SUM UP

In this unit you have learnt the concept of concepts of computer in ICT, Modern Technologies in Education

1.12 UNIT- END- EXERCISES

1. Define basic concepts of Computer?

2. Define types of computer?

1.13 ANSWER TO CHECK YOUR PROGRESS

1. A computer system is a combination of hardware and software. The physical and tangible parts/components of a computer that can be seen and touched are known as Hardware. When one looks at the computer system, he/she is actually looking at the computer hardware. The hardware consists of the physical components of a computer system like input devices (keyboard, mouse, scanner, etc.), output devices (monitor, printer, speaker, etc.), a processing device (CPU) and the storage device (Compact disk, hard disk, DVDs, etc.).

Software represents the set of programs and instructions that govern the operation of a computer system. A computer system cannot do anything on its own. It must be instructed to perform a specific task and therefore, to solve a problem the user has to specify the sequence of instructions which a computer must follow. Such a sequence of instructions is called the program and is written in a language understood by the computer.

2. There are Four Different Computer Types

We have four different computer types classified according to their performance, power, and size. A computer is an electronic device that accepts data, processes it, stores, and then produces an output.

There are different computer types available depending on the number of users they can support at any one time, their size, and power. In this hub, we are going to have a look at the difference between supercomputers, mainframe, mini, and microcomputers.

1.14 SUGGESTED READINGS

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UNIT II TRENDS IN EDUCATIONAL TECHNOLOGY

Structure

2.1 Introduction

'Educational Technology' is being used with great interest. It is believed that with the proper use of science and technology in the field of education, desirable results can be achieved in teaching, learning and testing. Educational Technology is a new area like educational philosophy, educational sociology, educational psychology, measurement and evaluation in education. Educational Technology provides the basis for the planning and organization of resources for learning and helps in achieving the teaching objectives. To help you understand the meaning of Educational Technology, Technology is essential. Therefore, we are throwing light on the meaning of the terms education, science and technology in this section.

The Latin word 'Educatum' means to train. 'E' means from inside and 'Duco' means to draw out, to lead out or to bring up. These terms, probably the routes of the word ‘education’ refer to the process of education i.e., drawing from within. Each child is born with some innate tendencies, capacities arid inherent powers. Education draws these powers out and develops them to the full. Latin words 'Educare' and 'Educere' mean to bring up, to lead out and to develop etc. In this way, the word education means to develop the inborn qualities of a child to the full.

It is very important to understand the meaning of Technology first and then the meaning of Educational Technology. It is because the entire creation and construction which the science has encouraged is all due to the medium of Technology. The progress of developed countries like America and Russia took place on the basis of science and technology only. J.K. Galbraith, in his book The New Industrial State, has given two main

characteristics of every technology. These are: (1) Systematic application of scientific knowledge to the practical tasks, and (2) The division of the practical tasks into sections and sub-sections. In the field of education, any technology which meets these two norms of the characteristics is called educational technology. Educational Technology defines teaching-objectives in behavioral terms. It is that science on the basis of which various methods and techniques are developed and constructed in order to achieve pre-determined teaching objectives. Thus, when the teaching objectives get determined, then educational technology comes into existence to achieve them.

First of all, it creates conditions by interpreting the input during the teaching process. It selects and applies the appropriate strategy for achieving the teaching objectives. In the end, looking at the output or abilities of the pupils, it is evaluated whether the teaching objectives have been achieved or not. If not, then what changes should be brought about in the teaching strategy or strategies so that the teaching objectives may be achieved. Hence, educational technology includes three processes. These are:

1. Functional analysis of teaching-learning process in which the teacher observes all those components which are applied as input and these come to light through output.
2. Separate or combined search and analysis of those components which are used in the teaching-learning process during input and output.
3. Presenting the acquired learning experiences in the form of research-outcomes. The following definitions will make the meaning of educational technology clear:
    - "Educational Technology is the application of scientific knowledge and learning and the conditions of learning to improve the effectiveness and efficiency of teaching and training."- G.O. Leith
    - "Educational Technology may be defined as the application of the laws as well as recent discoveries of Science and Technology to the process of education." - S.S. Kulkarni
    - "Educational Technology is that branch of educational theory and practice concerned primarily with the design and use of massages which control the learning process."- E.E. Hadden
    - "Educational Technology is concerned to provide appropriately designed learning situations which, holding in view of objectives of the leaching or Training, being to bear the best means of instruction." –Richmond

2.1.1 Growth of Educational Technology

The history of educational technology dates back to the early 19th century. Even in nineteenth century, the educational technology existed in the form of educational toys and other learning tactics. But its frequent use came to light in 1926. In Ohio state university, it was used in the form of a teaching machine by Sidney Presscy. Then around 1930-40, Lumsdain and Glaser tried to make education as

mechanical by presenting some special types of scrambled books, cards and boards. It should be remembered that the most important work was carried out during 1950 when B.F. Skinner developed Programmed Learning while carrying on experiments with animals. In 1950, Bryrumor, in England, used educational technology facilities for the first time. It is to be cared that in 1960, as a result of industrial revolution in America and Russia, other countries also started progressing in the field of educational technology. In this way, the beginning of educational technology took place in 1950's from America and Russia and now it has reached almost every country of the world. Now we see in teaching, due to various technological inventions like radio, tape-recorder, television, computer, CCTV i.e. closed circuit T.V., electronic video tapes and other audio-visual aids, many other numerous technologies have developed which are being used in the areas like industry, commerce, health, security and education.

The development of these devices has helped in the indoctrination of behavioral technology and in the field of teaching technology, models and designs. In other words, now the process of teaching has been mechanized. As a result, now in the three aspects of human knowledge, various types of machines are being used through which an effective teacher can provide benefits to the large groups of the students with the help of his knowledge. In this way, the concept of educational technology has developed in the field of education as a result of the mechanizations of teaching.

2.2 OBJECTIVES

After going through this unit, you will be able to:

- explain the concept, objectives and characteristics of educational technology
- describe the advantages, challenges and impact of educational technology
- explicit the concept knowledge explosion, preservation and retrieval
- recognize the meaning of communication and its different types
- explain the elements of communication and its process
- describe the concept and importance of ICT
- expound the Scope and Characteristics of ICT
- analyse the aims and objectives of National Policy on ICT in School Education in India.
- To modernise the learning methods and techniques after systematizing them so that these may be turned effective according to the needs of the changing era for the unknown future.
- To bring about desirable modifications in the behaviors of the teacher's and pupils by improving the teaching, learning and evaluation.

- To make the classrooms teaching easy, clear, interesting, effective, understandable, objective and scientific.
- To help in increasing various facilities by solving the most complicated problems of human life so that the human life may carry on its progress continuously.
- To identify the educational needs and aspirations of the community.
- To determine the aims, objectives and in general the structure of education.
- To develop an integrated curriculum of arts, science and human values.
- To identify and locate material resources and strategies for achieving the desired aims of education.
- To develop specific models of teaching to bring about an improvement in the teaching-learning process.
- To design, modify and develop appropriate equipment/aids suitable and relevant to the educational process.

2.3 Characteristics of Educational Technology

The characteristics of Educational Technology are as follows:

- Educational technology is based on the application of the scientific knowledge.
- Educational Technology has contributed in developing various methods, for example, micro-teaching method, simulated teaching, interaction analysis, audio-visual aids and programmed learning method.
- In the field of educational technology, psychology, science, technology, system, art, audio-visual aids and machines are used.
- Educational technology is helpful in making the teaching process objective, easy, clear, interesting and scientific.
- In educational technology, the provision of measuring tools is emphasized for the evaluation of learning outcomes.
- Desired changes are possible in the behavior of teachers and pupils.
- Educational technology is a continuous and dynamic technology.
- Educational technology encourages learning by controlling the environment.

2.4 Advantages of Educational Technology

The advantages of Educational Technology are as follows:

The use of technology would be to improve and extend learning or understanding. Increasingly, motivation, interest, convenience, and realism of experiences are also purposes; and they are meritorious purposes, though they should be subsidiary to the major ones. No matter how well chosen

are the words describing a building or the comfort achieved in an automobile by the use of a new spring design, words will never provide the insights that seeing the building or riding in the automobile will readily yield.

A textbook picture or a slide of the building cannot provide an equivalent of the experience available through the use of film or videotape. Film, videotape, computer-assisted instruction, laboratories, work-sample kits, and other educational technologies offer an enormous range of learning experiences well beyond those of the lecture or recitation in a classroom. It is important to understand that this increase in range of experiences, even when available, may only increase the insights and understanding achieved by students about concepts and principles initially presented in textbooks and lectures.

The students is provided with a wider range of sensory involvement and a better sampling of materials and experiences but uses them only to master traditional objectives largely limited to acquiring factual knowledge and the simpler skills. From our observations of the use of available educational technology, we conclude it is still highly underemployed. For example, many history classrooms have an extensive range of excellent maps; yet in some classrooms, the maps are seldom used and then for a very limited purpose, such as locating acity.

Educational technology can be used to extend the range of educational objectives by bringing into the student's environment much more potent deeper, richer, more complex, more realistic experience than could otherwise be had. The Ramayana can be read in a classroom over a period of weeks accompanied by lectures by the professor and the reading of various commentaries. If it happens that the play is being presented on television with an excellent cast, watching that broadcast, preceded by some introduction and followed by some discussion, should be a richer experience than simply reading and discussing the play.

Various forms of educational technology also provide the possibility of preserving peak and unique experiences. These would include films or videotapes of the performances of great musicians, of surgeons or of natural events that arc unusually picturesque or cataclysmic.

Educational technology may also provide learning experiences that are more pleasant and convenient than the traditional lecture, textbooks or classroom discussion. For example, educational television can bring significant learning into the home. Without time-consuming travel, an individual can sit in a comfortable chair on a stormy night and learn as much as in an uncomfortable classroom. Educational technology can also provide learning experiences that are less dangerous than the reality might be. The use of trainer equipment with realistic film for the education of pilots is effective and does not endanger their lives or risk an expensive plane. A film or videotape of a complicated laboratory experiment may give students insights into all aspects of the experiments while avoiding the possibility of accidents or explosions or the waste of materials.

Challenges of Educational Technology

The access to information continues to grow exponentially; school cannot remain mere venues for transmission of a prescribed set of information from teacher to student over a fixed period of time. Schools must promote learning to learn i.e. acquisition of knowledge and skills that make it possible to learn continuously over a life time. There is a paradigm shift from teacher-centered learning to student-centered learning. Today technological influence is so much that every aspect is going by e-electronic i.e. right from e-content, e- library, e-learning strategies, e-classroom, e-learning tools and technologies like moodle, lecture cast, web conferencing, and soon.

In this context it is very apt to explore the possible challenges for educational technologies to be implemented in education. The various challenges from time to time depending on the changing trends in technologies and their utility needs to be explored. In this process, some of the challenges are brought to light.

Environmental factors: The following factors are the challenges of educational technology. Inadequate hardware and software; Inadequate technology for using in the classroom; Quantity and quality of software is not up to the requirement; Up gradation of the peripherals and other requirements are not attended regularly; Problems with respect to support which is related to technical, pedagogical and management issues.

Training in technology to teachers: Mostly teachers lack the training in use of technology through in-service-training programs and they also lag in required knowledge, competencies and skills and "know-how" of using new technology in teaching. It is very difficult for teachers to use the technologies successfully in the absence of above said skills. Inspite of having positive attitude towards technology and willing to improve the effectiveness of teaching through technology due to various factors they are not able to implement. Well experienced, enthusiastic teachers do not have suitable training to use in the classroom their skills, ideas and ways to integrate technology.

Personal factors preventing teachers to use technologies: Various personal and psychological factors like confidence, fear, will and motivation are detrimental in using technology in the classroom. Most of the teachers who do not use computers lack self confidence in using computers and other technologies in teaching. Teachers also feel the discomfort of adopting to a new technology (due to unlearn and relearning), feel frightened and threatened to computer technology. Teachers with high authority with traditional teaching in the classroom fear and cannot think of failure with technology integration in teaching with similar effectiveness.

Teacher Attitude: Some teachers appreciate the beauty of technology and its effectiveness in teaching over traditional teaching and show positive attitude whereas some other teachers show negative attitude and are reluctant to use technology. The attitudes of teachers, vary significantly towards technology.

Resistance to change: Generally teachers do not cooperate or show positive view on new issues in curriculum or practices as it needs, efforts and also a question of status quo, as teachers' willingness to learn from others have difficulty. They feel the technological experiments are beyond their purview and scope of job and resist such change.

Challenge of new models of teaching: New models are creating unprecedented challenges to traditional models of schooling. The various online and open courses of study at higher education are widely used as they are very popular and the distance learning and new models are used by the regular and traditional practitioners.

Providing adequate technology access: Due to a lack of funds and attitudes, there is no access in terms of environment and suitable hands on experience to students. They are not able to equip themselves or cope with the new developments or use new technology. If we can provide access to all the students in their purview wave, then they can create a space to overcome the challenge of accessing technology.

Technical support for technology use and maintenance: It is very important that teachers need to be strengthened in using technology by handholding help where anxieties and other problems are encountered. But when teacher encounter technical problems, they need technical support at that time. Sometimes when a teacher is using technology in the classroom and if suddenly technology fails the whole planning and completing that task would suffer like the file does not open, projector fails, system fails etc.

Application of Computer in the field of Evaluation

A computer evaluation is defined as the process by which a computer system's resources and outputs are assessed to determine whether the system is performing at an optimal level. It is similar to a voltmeter that a handyman may use to check the voltage across a circuit. The meter verifies that the correct voltage is passing through the circuit. Similarly, an assessment can be done on a PC using established benchmarks to see if it is performing correctly.

Impact of Educational Technology

The prevalence of technology drastically affects many areas of society in positive ways, including education. Modern-day students not only have computers to help them with their schoolwork, they also use the Internet for research while teachers use technology to enhance their lessons. Let us discuss some of the major impacts of educational technology.

Research:

If a school's library is outdated or lacking in a selection of titles, a student might find it difficult to compile the necessary research for an essay or research paper. As long as the school has a computer lab, students are able to use the Internet and digital encyclopedias to obtain the research they need. While students should be wary of the legitimacy of some of the content they read online, many schools use software like the Encyclopedia Britannica to help students do research.

Globalization:

When schools in different parts of the state, country or world connect, students can "meet" their counterparts through video conferencing without leaving the classroom. Some sites, such as Glovico, are used to help students learn foreign languages online by pairing a group of students with a teacher from another country.

Educational Games:

In younger grades, teachers expose children to computers through educational games. Instead of playing board games that focus on education, students can learn the basics of spelling, counting and other early educational lessons through computer games that make learning fun. Because many schools have at least one computer in each classroom, the teacher can make that computer a vital part of learning for young students.

Distance Education:

In the past, students could take distance or continuing education classes, also called "correspondence courses," at community colleges and universities. After enrolling in a course of this style, a student would receive course documents in the mail and would be required to mail assignments to his teacher at the educational institution. The process could be long and complicated. Thanks to technology, continuing education students can take courses over the Internet at their convenience.

Web Seminars: Not every school has the resources and budget to send its students on field trips related to the course of study. When this is the case, the students' education can suffer. But thanks to technology, students can use the Internet to virtually attend Web seminars put on by museums and other educational institutions. NASA, for instance, offers a program that allows students to talk to astronauts in space.

2,5 Videotape

Videotape is magnetic tape used for storing video and usually sound in addition. Information stored can be in the form of either an analog signal or digital signal. Videotape is used in both video tape recorders (VTRs) or, more commonly, videocassette recorders (VCRs) and camcorders. Videotapes are also used for storing scientific or medical data, such as the data produced by an electrocardiogram.

Because video signals have a very high bandwidth, and stationary heads would require extremely high tape speeds, in most cases, a helical-scan video head rotates against the moving tape to record the data in two dimensions.
Tape is a linear method of storing information and thus imposes delays to access a portion of the tape that is not already against the heads. The early 2000s saw the introduction and rise to prominence of high quality random-access video recording media such as hard disks and flash memory. Since then, videotape has been increasingly relegated to archival and similar uses.

Television or the electronic visual and auditory transmission process made its debut around the nineteen-thirties. Initially it was designed for the entertainment and industrial fields. Its educational importance was realised much later, nevertheless still in good time to stretch its potential to its maximum limits as a one-way communication agent. Over these years television has made rapid technological advances in equipment quality. colour, multi-image screens, simpler recording and playback gear and now, but by no means terminal - the video projection system. Colour discrimination does play an important role in educational television, espec.ally in Health Science, Biology and Chemistry,

however there is no overwhelming evidence to show that it helps to improve learning in all the curricula. All along, there has existed a marked barrier of distinction between the television's educational role as against its entertainment or media agent's role for the masses. When an educational package goes on the air, a great many of the audience may sit up and take note of great many details: technical quality, content of programme, presentation techniques, errors and irregularities, language, relevancy and suitability of support materials and even the competency of the presenter. To put it plainly: one expects a television lesson to be nothing less than perfect! The advent of Educational Television in this country was in 1965 with the Educational Television (ETV) Pilot Project (KP. 8044, Kementerian Pelajaran, March, 1965). Since the launching of the servicejn 1972, media lessonslvia television with their complement of movement, specially desi.gned teaching aids, diagrams atld special photographic effects have had a considerable amount of effect in the presentation of difficult and complex components of the school curricula to learners. The involvement of the new medium in our country has certainly brought about new teaching and learning experiences and its integration into the daily class schedule has made it the third most consistent media in the classroom, next to the print and auditory domains. Its capacity to provide a matched auditory-plus-visual stimuli has been proven successful in certain subject areas in the United Kingdom and United States. It is not the intention of the Ministry of Education to telly-teach the entire school curricula to the students. Traditional and formal methods have worked well all along, but where a broader base is needed to present complicated items of a specific curriculum, the educational role of television has been planned and organised well and has come to stay as an efficient tool of learning. It is therefore left to the innovative educator to exploit to the maximum the characteristics of television in order to increase his instructional efficiency to a group of learners who may otherwise be subjected daily to dull and drab lessons with chalk and talk.

2.6 Radiovision

Radiovision is one of the lesser known, successful educational mass media, involving the recording of a sound broadcast, which is then played to its intended audience, together with a specially designed filmstrip. It is cheap, flexible and uses large, high quality, colour illustrations. It has been successful in many parts of the world, e.g. Australia, Africa, and Europe. Research findings are few but indicate the wisdom of extending the medium and further exploiting it. At present, it is used for the 7-18 age group, though there are variations in use or being tried in higher education, e.g. by the Open University. Its extension as a medium in its own right to a wider variety of subjects, as alternatives to television, in certain circumstances as a means of revising television is desirable. It may be useful to explore other means of equally closely integrated sound/vision programs, using for example, booklets or posters as well as filmstrip. Radiovision needs more research, as do the slide/ tape variations in use. It remains important to exploit existing aids fully especially in view of present financial stringencies.

Television (an early name used by Charles Francis Jenkins for the technology)
A BBC radio educational program for schools that was distributed with slides and films

A subsidiary company called Radiovision Broadcast International which was formed in 1966 by Pearl & Dean, originally to represent the marketing interests of American Broadcasting Company in Europe.

2.7 Teleconferencing

Education and healthcare are basic needs for human development. Technological innovation has broadened the access to higher quality healthcare and education without regard to time, distance or geopolitical boundaries. Distance learning has gained popularity as a means of learning in recent years due to widely distributed learners, busy schedules and rising travel costs. Teleconferencing is also a very useful tool as a distance learning method.

Teleconferencing is a real-time and live interactive programme in which one set of participants are at one or more locations and the other set of participants are at another. The teleconference allows for interaction, including audio and/or video, and possibly other modalities, between at least two sites. Various methods are available for setting up a teleconferencing unit. A detailed review of the trend in the use of teleconferencing in medical education was conducted using Medline and a literature search.

Teleconferencing was found to be a very useful tool in continuing medical education (CME), postgraduate medical education, undergraduate medical education, telementoring and many other situations. The use of teleconferencing in medical education has many advantages including savings in terms of travel costs and time. It gives access to the best educational resources and experience without any limitations of boundaries of distance and time. It encourages two-way interactions and facilitates learning in adults. Despite having some pitfalls in its implementation it is now being seen as an important tool in facilitating learning in medicine and many medical schools and institutions are adapting this novel tool.

The Importance of Teleconferencing in Education

1. Remote Learning

One of the most apparent advantages of teleconferencing in education is remote learning. Students no longer have to feel confined to their classrooms. With teleconferencing, they can reap the benefits of knowledge from all over the globe. They can interact with experts, students from other schools, and visit places they have never visited at the push of a button.

With teleconferencing, educators can make themselves available even when they are not at the school. This means they can lecture students who might need their help outside office hours, or collaborate with other experts and specialists without them having to be in the same classroom.

2. No Need to Go on Field Trip

As teleconferencing can be conducted anywhere in the world between different classrooms, no longer do students need to go on field trips as

much. This will save the schools the time and the energy. Cost reductions can also be significant. Being able to teleconference with hundreds of students will certainly reduce expenses. Compared to the conventional method of cost of bus, train flight and meals, teleconferencing offer many cost savings. You can take your students on a trip thousands of miles away with only at a push of a button. The school management can use the time and cost saved from reduced trips more productively.

3. Attend Class from Home

Another use of teleconferencing in education is that it allows students attend class from home. Sometimes students may miss classes due to illness or challenges related to living in remote areas. Teleconferencing gives these students a real chance to attend classes from their homes, meaning they won't fall behind in class. This also works perfect for educators as staff meetings can be done through teleconferencing. This simply means that staff members can cut straight to the live meeting and eliminate the unnecessary travelling and stress. The meeting can also be recorded and passed to staff members who were unable to take part in the live meeting.

4. Strengthen Exchanges among Schools

Weeks after a devastating earthquake struck Haiti in 2010, hundreds of high school students from New Orleans in Louisiana gathered at Fisher to discuss with students from New American School in Haiti's capital Port-au-Prince. The students shared terrifying experiences, messages of hope and encouragement, as they bonded over a video conference initiated by the Global Nomads Group. Most schools are using the technology to connect with students from other schools. This presents a great opportunity for students to connect with other students that they would possibly never meet otherwise.

5. Invite Experts to the Class Wherever They Are

With teleconferencing in education, boring classroom learning is a thing of the past. The technology gives educators new and exciting ways to teach their students. For instance, the technology allows teachers to invite guest speakers into the class to help illustrate important points in her lesson. This allows for an interactive experience for students with experts that boast a wealth of skills in the field being discussed. As well all know, specialists often have busy schedules. As such, teleconferencing is a better option as it can reduce travel time and simplify visits. Using this technology, a major college in a rural area was able to connect chemist specials with students undertaking the course for a detailed workshop.

6. Connect Rural Schools to Outsides for Better Education

Limited resources remain the common problem in most rural schools. Students in these areas have missed out on countless opportunities that their urban counterparts continue to explore. Connecting students in these areas via teleconferencing can greatly improve the quality of their education, ensuring that their rights to education are ultimately met both in practice and in theory.

With teleconferencing in education, teachers connect their classes with the outside world to cross traditional classroom boundaries. This also prepares students to be citizens of the more open and more tolerant world of tomorrow.

Best Tool to Apply Teleconferencing in Education

There are many teleconferencing services for education out there, making it difficult for schools to choose one that will meet their needs. We spent a few days looking for teleconferencing services that will best suit your educational needs. During our search, we found that ezTalks Meetings is well worth consideration and for good reasons.

This video teleconferencing service out there to enable schools to deliver top quality remote learning experience to their students, invite experts to do online presentations for their students from anywhere in the world, gather teachers on a same page to attend teaching training and exchange teaching experience record online class for after-class playback.

There are four types of teleconferencing based on the nature and content of interactivity and sophistication of the technology.

Audio conferencing

- Audio graphic conferencing
- Video teleconferencing
- Web-based conferencing
- Three essential features of teleconferencing are:
- Students/participants are present at a particular time and in dispersed places.
- Resource persons are present at the same time at the teaching end or different teaching ends.

There are interactions between:

- Student – resource persons/AV materials at the teaching end(s)
- Student – student at the education centre
- Student – facilitator/materials/activities at the education centre
- Student – student at/between other education centres
- Resource person – resource person

This article is an opinion on the use of teleconferencing in medical education.

This opinion is based on a Pub Med and literature search for relevant publications in the subject. The search terms were the words “Teleconferencing in medical education”, “Videoconferencing”, “Video teleconferencing”, “Telemedicine” and “Distance education”. A reference list of “Journal of Telemedicine and Telecare” was also searched. A total of 146 articles were reviewed. The search included original research articles, review articles, case reports, and chapters in books, letters to the editor and conference proceedings.

Distance learning in medicine has gained popularity nowadays. The preference for distance education for those choosing this format has several contributing factors. The cost of travel, financially and in human resources, has decreased the potential for attending meetings far from home. Downsizing of practices - with fewer health professionals available to do the work - has limited the ability of these individuals to get away from practices long enough to take advantage of CME offered in distant cities.

There has been a technology explosion over the last few years, characterised by smaller, faster, cheaper computer systems and improvements in software. Telecommunications advances have taken us from the old-fashioned telephone/telegraph/radio options to dedicated phone lines (T1, etc.) and the Internet. As these technologies have advanced, it is not surprising that they have penetrated virtually all areas of our lives – including medical education. Medical tele-education has also grown with the growth of telemedicine.

The first step in meeting today's students' needs is to adapt multiple curriculum delivery methods into the educational environment. Traditional large-group lectures may satisfy the learning and lifestyles of some students, while others may need diverse methods. Offering multiple learning modalities to students like teleconferencing can meet students' individual needs.

An increased emphasis on research and clinical practice has resulted in less faculty time for teaching, with new demands on administrators in the delivery of medical school curriculum. This has led teachers to look out for other modalities of imparting education.

With the enhancement of technology, e-learning is becoming an educational tool to deliver many aspects of curriculum. E-learning uses the Internet to deliver curriculum content and allows students to control content delivery, including the sequence, pace, and time. E-learning modalities include distance learning and computer-based delivery models. Internet protocols are now currently robust enough for two-way point-to-point and multipoint videoconferencing, especially over advanced research and education networks such as Internet-2.

CME has become increasingly important for doctors during the past decade. This has favoured development of innovative learning methods including teleconferencing.

Nature of the trend of use of teleconferencing in medical education

1. Continuing Medical Education (CME):

The most widespread use of teleconferencing in medical education is in the field of CME. Due to the rapid evolution in the medical sciences, lifelong learning is required for everybody involved in the medical field. CME has become increasingly important for doctors during the past decade and with the growing requirement for continuous improvement of quality in medical practice, it is now virtually mandatory in well-organised systems of medicine.4Due to busy time schedules and high costs of travelling, videoconferencing provides a good option for medical professionals to save on time and costs to update their knowledge. Busy health professionals desire access to learning anytime and anywhere, including at home in the middle of the night. There have been constant efforts to evaluate which is the best format for CME and it has been realised that small group teaching fulfils the format most effectively. This fits in well with the concept of making use of telemedicine or videoconferencing in this area since relatively simple equipment can be used to receive teaching materials from a centre even in the doctor's office. Such classes are usually quite small and it is possible by means of a bridge to speak to several sites at the same time and remain interactive.

A project was started in Belgium called "Pentalfa" in which the authors took the option of teleconferencing to offer a part of the CME in the form of long-distance education and CME for the postgraduates. This was highly successful and the participants appreciated this CME project using teleconferencing.

In Nova Scotia, a tele-health network has been developed which has used videoconferencing for CME since 20006 and has been reported as a success. At the Mayo Clinic USA, a satellite system network is used for educational programming and activity and has been an integral part since 1986.

The University of Alberta uses videoconferencing to link physicians in interactive continuing health education. In a study conducted about the programme, results showed that the audience were very satisfied with the programme and felt that the sessions were relevant to their practice. The interactive discussion component was rated very highly. Most respondents stated that they would change their practice based on the information discussed. Morganti et al suggested that videoconferencing networks are appropriate for CME and for distance education, in particular in the discipline of radiotherapy.

Other CME initiatives include videoconference journal clubs and small group learning. In a study involving videoconferenced journal clubs in dermatology the participants' satisfaction with the videoconferencing journal club was high. The adoption of videoconferencing produced promising results, increasing the efficiency of house officer training.

2. Use of teleconferencing in medical conferences:

Interactive live videoconferencing is being used for the transmission of live surgeries from the operation theatre complex to the conference venue many miles away or even put as a podcast on the Internet. This helps the audience to learn, interact with operating surgeons sitting many miles away from the operation theatre. In an international videoteleconference for orthopaedic trauma education, interactive video teleconferencing successfully met the expectations as an educational tool and the remote participation did not adversely affect the ability to engage in. discussion.

3. Use of teleconferencing in undergraduate medical educattion:

Teleconferencing has also been used in undergraduate medical education. Several medical schools have used teleconferencing technology to “extend the walls of the campus”. The state of Georgia has implemented the Georgia State-wide Academic and Medical System, a distance learning teleconferencing network that allows the transmission of educational courses to remote campuses. There is the possibility of medical students studying their basic sciences to learn – at least in part – from home, in a way which better suits their learning style than conventional didactic lectures.

Medical students can also be offered lecture content covering clinical objectives via interactive videoconferencing and a study shows that the students learn content focused on clinical learning objectives as well as using videoconferencing as they do in the traditional classroom setting. Videoconferencing of a live pelvic surgery was used to teach first year medical students about pelvic anatomy. In this study, students having recently completed their cadaver dissection and a practical on pelvic anatomy attended a live pelvic surgery through a videoconference that provided two-way pictures and voice conversation.

A study was done to evaluate the concept of a telemedicine-orientated educational application by exposing junior medical students to surgical teaching via videoconferencing from the operating theatre and comparing this to the traditional method currently employed, which requires the presence of students in the operating room. Their experience with telemedicine assisted surgical teaching indicated high acceptance and satisfaction rates by clinical students.

4. Videoconferenced grand rounds:

Videoconferencing connects sites for grand rounds and other sessions traditionally hosted by a medical centre/teaching institution, and allow peripheral sites, maybe in different countries, to present clinical material during these rounds. The Long Island Jewish Medical Centre and five other hospitals hold paediatric grand rounds via video-conferencing.

5. Videoconferencing in postgraduate medical education:

Video-conferencing is widely used for educational purposes throughout the world. The use of videoconferencing for post-graduate medical education is not new and has been shown to be effective.

Videoconferencing is being extensively used by the National Board of Examinations in India for the training of postgraduate and doctoral students in medical specialities including super specialities. The programme is live with twoway audio and video interaction of students and the teachers. The students can have one-way video and twoway audio interactions as the programme is beamed via a satellite. A toll free number is given to the students to interact with the experts during the videoconference.18Audio conferencing sessions have been used by the National Board of Examinations, a premier post-graduate examination body in India for interactive radio counselling for training of post-graduate students.

An Australian centre provided synchronous tutorials in paediatric surgery using videoconferencing at two rural sites with the tutor located at a metropolitan paediatric clinical school. Videoconferenced surgical tutorials were highly valued by post-graduate medical students as an educational method.

6. Mentoring via videoconference:

Telementoring — defined by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) as real-time interactive teaching of techniques by an expert surgeon to a student not at the same site was first performed in 1962 by De Bakey.

Telementoring has been developed to allow a surgeon at a remote site to offer guidance and assistance to a less experienced surgeon and to reduce the complications associated with surgeon inexperience.

Several studies of surgical telementoring over large distances have been conducted in various parts of the world. K.M Augestad quotes Cubano in his article that longdistance telementoring was an invaluable tool for providing instantly available expertise during laparoscopic procedures.

7. Use of videoconferencing in teaching practical skills:

Videoconferencing also facilitates skills instruction and assessment at a distance. Examples include teaching surgical procedures through off-site observation, teaching hand assessment techniques for physical therapists, improving paediatric resuscitation skills through observation and participation, assessing neonatal resuscitation skills and assessing surgeons' informed decision-making skills using a video conferenced standardised patient.

8. Blended education strategy:

A multi-continental, multilingual educational service can be offered through videoconferencing, multimedia information superhighways and tele-broadcasting networks. Attractive programmes can be made combining conventional lectures, workshops, talkshows, teleconferencing and tele-proctoring methods.

Consequently, many institutions have adopted blended learning approaches combining face to face and distance learning. Video-conferencing is becoming part of the mix of technologies to provide distance education and blended learning in varied areas of health science.

9. Development of educational satellite:

More educational satellites are now planned to enhance penetration of telemedicine and teleconferencing in our lives.

Advantages of using teleconferencing in medical education

There is tremendous excitement about the future of medical tele-education. Perhaps one of the main reasons is that it affords opportunities which were previously unavailable for the health professional student, practitioner, or individual patient because of circumstances of geographic location, travel limitations, economics or personal choice, to avail them of medical knowledge personalised for them.

Videoconferencing has many advantages that enable distance and, to some extent, time problems to be overcome. Time required for travel is an important barrier to attendance, and videoconferencing overcomes this problem and eliminates the associated travelling costs. In addition, it improves the efficiency of training programmes generally by enabling sessions to be held more frequently.

It overcomes time or scheduling problems for students who can assemble at an education centre for a limited period only because of their full time or part time work, and family and community commitments.

It allows the best of educational programmes and learning opportunities to be delivered from anywhere in a country or overseas and delivers them directly to the receiver whilst allowing simultaneous interactive teaching at many sites. Distance is now not a barrier for good quality learning and education.

Providing a curriculum to students scattered over a broad geographical area is a challenging problem. Videoconferencing is a potential method of providing educational programmes to virtually all residency programmes with considerable cost and more effective use of the resources. Videoconferencing has the potential for providing timely, high quality educational programs to viewers who may be scattered over a wide geographical area.

It is a practical and cost-effective method of sharing educational resources between two or more institutions. Results show that videoconferencing has the potential to become a practical, cost-effective method of sharing educational resources by means of interactive multi-site educational programs.

Videoconferencing via satellite makes real-time interaction possible between audience and faculty as well as central production of resource intensive course material which makes it an appealing educational tool.

The videoconferencing sessions can also facilitate collaborated learning even when students are located far apart.

Disadvantages

Although teleconferencing is a very useful tool, it has some disadvantages in some settings.

The initial cost of the equipment and leasing the lines to transmit conferences may be prohibitive.

Companies which produce codec's have each developed unique methods of compression which may be incompatible with the equipment at different sites, the desired method of communication or software, although protocols have been established to allow communication among brand names.

If the bandwidth that carries the transmission among sites is not large enough, the students may observe ghost images when rapid movement occurs in real-time. If the system is not properly configured, class members may observe an audio echo effect. The result is audio interference that detracts from the learning environment.

Technical problems can lead to the failure or interruption of the teleconferencing sessions. Sometimes these problems need a long time to be resolved which may lead to cancellation of the session. Technical problems include power failure at the remote end and disconnection of the satellite link.

There is no direct self-directed learning through teleconferencing. However the student may choose teleconferencing through a self-directed approach as the preferred modality of learning.

It is difficult to teach psychomotor skills using teleconferencing.

Videoconferencing technology can constrain dialogue, and students at distant sites often feel more disconnected than those on site. Unless a strong effort is made by the instructor, students not located with the instructor may remain uninvolved in the course. Students may appreciate hearing answers to questions others ask even though they do not ask questions themselves.

2.8 ETV

Educational television or learning television is the use of television programs in the field of distance education. It may be in the form of individual television programs or dedicated specialty channels that is often associated with cable television in the United States as Public, educational, and government access (PEG) channel providers.

There are also adult education programs for an older audience; many of these are instructional television or "telecourse" services that can be taken for college credit. Examples of these include Open University programs on BBC television in the UK.

Many children's television series are educational, ranging from dedicated learning programs to those that indirectly teach the viewers. Some series are written to have a specific moral behind every episode, often explained at the end by the character that learned the lesson.

In the social aspects of television, several studies have found that educational television has many advantages. The Media Awareness Network, explains in its article, The Good Things about Television, that television can be a very powerful and effective learning tool for children if used wisely. The article states that television can help young people discover where they fit into society, develop closer relationships with peers and family, and teach them to understand complex social aspects of communication.

Mexican TV producer Miguel Sabido pioneered in the 1970s the use of telenovela to disseminate the government's policy views to mass audiences. The "Sabido Method" has been adopted by a number of countries, including India, Kenya, Peru, and China

2.9 CCTV in Education Institutions

Security, theft and student/teacher personal safety are an increasing priority for Principals. There has been a general decline in respect for public assets.Education over the last 30 years or so. Where once it might have been the norm to allow visitors onto school and university grounds, this now poses a potential threat for students, teachers and material assets.

The use of CCTV in educational institutions can be broken down into two broad categories.

Personal safety of students, teachers and other stakeholders.
Protection of building infrastructure assets and learning tools i.e. computer equipment.
Specifically, issues such as graffiti, vandalism, anti-social behavior and unwanted visitors need to be addressed by all education establishments. With the ever increasing cost of new technologies in schools, the risk of burglary, arson and vandalism needs to be given the appropriate consideration.

Bullying is a major problem in many schools, CCTV is being used as a tool to reduce this issue by placing cameras at strategic locations, that are known to be hot-spots. When an incident occurs an authorised user will review the footage and identify the culprit/s.

Drugs are another concern, video evidence of drug dealing can be passed on to the Police.

Closed Circuit Television (CCTV) systems have long been one of the tools used to decrease the risk of such issues. Traditionally CCTV systems have been costly to implement due to the layout of schools and universities. Long cable runs from each camera back to a central viewing and recording system are now a thing of the past.

Camvex Video Surveillance has developed a CCTV/IP video system which utilises the facilities' own IP network, removing the need to install cable runs to a central location. This reduces installation costs substantially.

Cameras can be recorded locally, near network nodes usually located in each building or at a central location.

Nominated Users can monitor and playback camera footage from any authorised PC. Oursolutions support a wide choice of CCTV technologies and cabling infrastructure.

CCTV Technology choices

We pride ourselves on giving you choice of CCTV technologies as well as supporting multiple platforms concurrently under one software platform. Almost all these options are capable of utilising your existing cabling infrastructure which saves you are great deal of money.

2.10 INSAT

Educational technologies are particularly important for developing countries like ours at different levels. Higher distance and open learning have grown at an accelerating pace in the last two decades. In our country distance learning accounts for 24% of University students and the Government policy aims to raise this to 40% in the near future. In our country women make up to 40%of distance education students compared with 28% in the conventional face-to-face mode.

The problem of non availability of quality teacher educators, Education technologies can address this crucial problem at least partly.
The major role of education is capacity building rather than just awarding degrees and diplomas.

Education for technology and technology for education should be an motto with the use of technology it becomes possible to teach the individual rather than the class at the pace of the individual than the class average. Education is a lifelong, continuous process. Recurrent education, distance education are some of the latest trends in the field of education. Education, the act or process of acquiring and imparting knowledge, is crucial to the development of a learner with a view to his/her participation in the transformation of the world for a better tomorrow. These types of education have become possible because of the use of mass media generally includes the press, the radio, the cinema and the television. Television is becoming a very pervasive medium even in developing countries. It has made deep inroads in the educational field. Now, it is not the question whether to use televisions for educational purposes but it is a question of how to use television for educational purpose.

2.11 EDUCATIONAL SATELLITE - EDUSAT

The concept of beaming educational programmes through satellites was effectively demonstrated for the first time in India in 1975-76 through the Satellite Instructional Television Experiment (SITE) conducted using the American Application Technology Satellite (ATS-6). During this unique experiment, which is hailed as the largest sociological experiment conducted

anywhere in the world, programmes pertaining to health, hygiene and family planning were telecast directly to about 2400 Indian villages spread over six states. Later with the commissioning of INSAT system in 1983, a variety of educational programmes had been telecast. In the nineties, the Jahabua Developmental Communications Project (JDCP) and the Training and Development Communication Channel (TDCC) further demonstrated the efficacy of tele education. With the success of the INSAT based educational services, a need was felt to launch a satellite dedicated for educational service and ISRO conceived the EDUSAT project in October 2002. India's educational programme got a fillip on 20 September 2004 with the successful launch of EDUSAT, from the launch pad of the Satish Dhawan Space Centre, Sriharikota, Andhra Pradesh EDUSAT is an indigenously designed satellite, which is exclusively devoted to the field of education. This is a path breaking effort in the concept of Tele-education.

"Democratization of knowledge indicates knowledge for anyone, anytime and anyplace. EDUSAT will be extremely helpful in making the shift possible and decreasing the digital divide" says Our Former president of India Abdul Kalam. "EDUSAT is a futuristic educational development experiment specifically configured to meet the special need of India. It should become a focal point for multiple dimensions of education" remarked K. Kasturirangan, during whose chairmanship of ISRO the idea of EDUSAT was conceived. EDUSAT was expected to fulfil several of India's needs in education.

EDUSAT is really a boon to poor India as its strategies are high relative quality and low relative price. With the commitment to develop young people to global citizens the programme will further encourage the internalization of our education. Objectives of EDUSAT are

- Providing support to formal and non-formal education
- Teachers' training program
- Increasing access to quality resource persons, •Enhancing community participation,
- Taking education to remotest corner of the country.

EDUSAT can be used for

- Conventional Radio and Television broadcasting
- Interactive Radio and Television (phone-in, video on demand.)
- Exchange of data
- Teleconferencing both one way and two way, Audio conferencing &
- Computer conferencing
- Web based education

EDUSAT live Transmission

EDUSAT network has done exceptionally well in the past and has won many laurels since it began live transmission on 5th September 2005. In the live transmission, CEC acts as the teaching end. Subject Experts deliver lectures live. These lectures are received by various SITs and RoTs. They are known as Class Room End. The Teaching End can be shifted from one SIT to another. Thus, the students can benefit from experts located in various Educational Institutions across the country.

The Expert can address the queries of the students in the live mode. The students can interact and ask questions using the following three methods.

- Audio Video Conferencing
- Text Mode
- Through Telephones

EDUSAT is the first exclusive satellite for serving the educational sector. It is specially configured to meet the growing demand for an interactive satellite based distance education system for the country through audio visual medium, employing Direct-to-Home (DTH) quality broadcast.

The scope of the EDUSAT programme is planned to be realized in three phases. In the first phase of pilot projects, Ku-band transponder on board INSAT-3B, which is already on orbit, is being used by Visveswaraiah Technological University (VTU) is the main beneficiary of this pilot project. Under this project, all engineering colleges of VTU are being net worked with 100 nodes. Beside Karnataka, the Y. B. Chavan state open University, Nasik in Maharashtra and the Rajiv Gandhi Technical University in Madhya Pradesh are covered. In the second phase, EDUSAT spacecraft will be used in a semi operational mode with at least one uplink in each of the 5 spot beams. About 100-200 classrooms will be connected in each beam. Two more states and one national institution will be covered. In the third phase, EDUSAT network is expected to become fully operational, ISRO will provide technical and managerial support in the replication of EDUSAT ground system to manufacturers and service providers. EDUSAT will be able to support about 25-30 uplinks and about 5000 remote terminals per link.

While ISRO provides the space segment for EDUSAT System and demonstrate the efficacy of the satellite system for interactive distance education, content generation is the responsibility of the user agencies. ISRO provides technical and managerial support in the replication of EDUSAT ground systems to manufacturers and service providers. End users are expected to provide funds for this. All educational institutions having Satellite Interactive Terminals (SITs) or Receive Only Terminals (ROTs) can now receive educational programs from EDUSAT, the first Indian satellite built exclusively for serving the educational sector, and can interact and ask questions through audio-video conferencing or text mode or through telephone.

Curriculum-based education is being imparted via the satellite by the University Grants Commission (UGC) through the Consortium for Educational Communication (CEC). The infrastructure of EDUSAT is being utilized by Indira Gandhi National Open University -(IGNOU) for curriculum based education, teachers' training, professional educational courses and for conducting teleconferencing sessions for software content generation.

National Council for Educational Research and Training (NCERT) also conducts interactive orientation/training programs of teachers and teachers' educators. The Department of Science and Technology (DST) utilizes EDUSAT network for group discussion, lectures, demonstrations, video-shows, training and capacity building programs.

Use of EDUSAT in Teacher Education

For any nation, the level and quality of education is one of the most important parameters for development. In India, the total literacy has gone up over the years but the quality needs tremendous improvement. The synergy between education and learning has to be well perceived and organized. The result of learning is the application of knowledge and skills by the individual for the benefit of the society, nation and the world. One of the serious problems associated with Indian school education has been high dropout rate. The reasons are many and varied but the major constraints are: non-availability of adequate number of competent and trained teachers in most of the schools and other institutions including teacher training institutions.

The Ministry of Education document Challenge of Education: A Policy Perspective" (1985) has mentioned, Teacher performance is the most crucial input in the field of education. Whatever policies may be laid down, in the ultimate analysis these have to be implemented by teachers as much through their personal example as through teaching learning processes." India has reached the threshold of the development of new technologies which are likely to revolutionize the classroom teaching. Unless teachers are capable and committed, the education system cannot become a suitable and potential instrument of national development.

India faces the challenge of regularly training a large number of teachers spread over vast geographical areas in different content areas and pedagogical aspects in the shortest possible time. It is not possible to cope with the numbers through institutional training alone. Orientation of teachers and teacher educators of such a huge system at regular intervals is always a challenging task. Covering all such teacher educators only through face-to-face training and orientation programs is practically impossible.

The National Policy of Education – 1986 revised in 1992 recognized the need for improving in-service training; accordingly Program of Action of the policy emphasized the necessity for providing regular in- service training to school teachers. In this direction, a Program of Mass Orientation of School Teachers (PMOST) was formulated and organized between 1986 and 1989 with the collaboration of State Council of Educational Research and Training (SCERTs). In this program about 17.62 lakhs school teachers were trained and oriented specifically to the use of materials supplied under the Operation Black Board scheme. In addition to this a scheme called Special Orientation Program for Primary School Teachers (SOPT) launched during 1993-94 with a view to improve the quality of primary and elementary education as a part of the strategy of achieving Universalization of Elementary Education (UEE). The SOPT program was launched on a massive scale to cover 18 lakhs teachers at a rate of 4.5-lakh teachers, each year during the last 4 years of VIII Five Year Plan period. Special Orientation of Primary School Teachers (SOPT) and Program for Mass Orientation of School Teachers (PMOST) was organized through adopting such strategy.

In the implementation of this two schemes of teacher training certain deficiencies have been noticed. They are: non-availability of large number

of equally competent resource person, transmission loss in imparting training through multi-tier training, inability to cover large number, spread over the vast regions and the quality dilution through such programs and the resource crunch with the states. To meet the twin challenges of reaching out to a large number of teachers with quality training, different educational agencies in the country have been organizing satellite-based interactive teacher training programs.

Teacher Training through Satellite Education (EDUSAT)

The extension of quality education to remote and rural region becomes a Herculean task for a large country like India with multilingual and multicultural population separated by vast geographical distances.

The shortage of trained teachers, lack of quality teaching especially in the rural areas, teacher absenteeism, need for uniform quality education, need for improvement in Science, Math's and English teaching requires to orient the teachers. One must realize that to face such a complicated challenge the known traditional methods and conventional response will be far too inadequate. Effective response to such a complicated challenge to educate millions with quality could be satellite based ICT enabled education. The clever and innovative integration of information communication technologies in an open and flexible academic structure would help India to address questions like increasing demand, quality and excellence and utility of higher education. There is a wide range of ICT enabled educational delivery modes. This includes, one way TV broadcast, Interactive TV via Phone in, Interactive TV with computer support through-mail, videoconferencing, Computer conferencing, telephone conferencing, Web-based instructions, etc.

Adoption of all these methodologies is possible only with right kind of satellite support. Satellite can establish the connectivity between urban educational institutions with adequate infrastructure imparting quality education and the large number of rural and semi-urban educational institutions that lack the necessary infrastructure. Besides supporting formal education, a satellite system can facilitate the dissemination of knowledge to the rural and remote population about important aspect like health, hygiene and personality development and professionals to update their base as well. Thus in spite of limited trained and skilled teachers, the aspirations of the growing student population at all levels can be met through the concept of tele-education. Therefore, there was a growing demand for an interactive satellite based distance education system for the country. One of the functions of DIET is Organising EDUSAT programmes for educational purposes.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. Define CCTV

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2. Define Radio Vision?

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2.12 Let Us Sum Up

In this unit you have learnt the concept of Trends in Educational Technology.

2.13 UNIT- END- EXERCISES

1. Define teleconferencing

2.14 ANSWER TO CHECK YOUR PROGRESS

Teleconferencing

Education and healthcare are basic needs for human development. Technological innovation has broadened the access to higher quality healthcare and education without regard to time, distance or geopolitical boundaries. Distance learning has gained popularity as a means of learning in recent years due to widely distributed learners, busy schedules and rising travel costs. Teleconferencing is also a very useful tool as a distance learning method.

Teleconferencing is a real-time and live interactive programme in which one set of participants are at one or more locations and the other set of participants are at another. The teleconference allows for interaction, including audio and/or video, and possibly other modalities, between at least two sites. Various methods are available for setting up a teleconferencing unit. A detailed review of the trend in the use of teleconferencing in medical education was conducted using Medline and a literature search.

Teleconferencing was found to be a very useful tool in continuing medical education (CME), postgraduate medical education, undergraduate medical education, telementoring and many other situations. The use of teleconferencing in medical education has many advantages including savings in terms of travel costs and time. It gives access to the best educational resources and experience without any limitations of boundaries of distance and time. It encourages two-way interactions and facilitates learning in adults. Despite having some pitfalls in its implementation it is now being

seen as an important tool in facilitating learning in medicine and many medical schools and institutions are adapting this novel tool.

2.15 ANSWER TO CHECK YOUR PROGRESS

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5. Ray, P.K.S (2006). Technology of Instructional Design, Part I. Delhi: Dominant Publishers and Distributers.
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UNIT III RESOURCE CENTERS FOR EDUCATIONAL TECHNOLOGY

Structure

3.1 Introduction

Education technology has the potential to provide equal opportunities in several ways Access to educational technology at school can give students from low income homes, where there is little or no access to technology, "a needed edge to compete with children from more affluent homes where technology is common place in other words we can say that guaranteeing access for all classrooms to affordable educational technology in order to achieve curricular goals makes it possible to begin to address the inequities that exist among schools. Grabe and grabe note that technology in the form of telecommunications allows access to people access to interactive services through online discussion groups, interactive conference and interactive tutorials and access to files through online databases, library holdings texts and graphic files on the internet.

3.2 Objectives

1. To understand concept of instructional resource centre.
2. To design the components of instructional resources centre
3. To list out necessary equipment and accessories of an instructional resource centre.

3.3 Central Institute of Educational Technology (CIET)

It is an institution under the NCERT which is located at New Delhi.

It is mainly concerned with the development of innovations and with using various media in school education. It comprises several units such as

programmed Learning, Educational Television, Innovations, Production and Evaluation.

It has organized the training of teachers for the Satellite Instructional Television Experiment in different states.

The institute is concerned with education at all levels and in all its aspects. I t aims at bringing about improvement of education through various kinds of educational technologies. It has to deal with pre-primary, primary, Secondary, and University Education, Open University education, Containing Education, Adult Education and so on.

3.3.1 Functions of the CIET:

The major functions of the CIET are as follows:

1. Designing alternative learning systems to deal with problems of education.

2. Orientation of educational planners' administrators to the concept of educational technology.

3. Training in specialized areas, radio, audio, television and video production and low-cost teaching aids.

4. Production of audio- visual educational materials and other low-cost aids.

5. Research and evaluation to test and improve systems, methods and materials.

6. Extension services for supplying and screening of educational films, videotapes and audiotapes to Dooradarsan.

7. Consultancy of educational technology and distance education programmes.

8. Working as co-ordinating agency with the Ministry of Human Resource Development, State and International organizations and UN agencies.

Major activities

Planning the T.V. Curriculum, training script-writers, producers, researchers and technical staff, production of educational programmes and research.

So CIET has been playing a pivotal role in implementing various innovative projects in educational technology both at National and State levels.

3.4 University Grants Commission (UGC)

The UGC was first formed in 1945 to oversee the work of the three Central Universities of Aligarh, Banaras and Delhi. Its responsibility was extended in 1947 to cover all Indian universities. In August 1949 a recommendation was made to reconstitute the UGC along similar lines to the University Grants Committee of the United Kingdom. This recommendation was made by the University Education Commission (1948-1949) which was set up under the chairmanship of S. Radhakrishnan "to report on Indian university education and suggest improvements and extensions".

In 1952 the government decided that all grants to universities and higher learning institutions should be handled by the UGC. Subsequently, an inauguration was held on 28 December 1953 by Maulana Abul Kalam Azad, the Minister of Education, Natural Resources and Scientific Research. UGC was formally inaugurated by Abdul Kalam Azad, the minister of Education. The motto of UGC is "Gyan-Vigyan Vimutaye".

In November 1956, the UGC became a statutory body upon the passing of the "University Grants Commission Act, 1956" by the Indian Parliament. In 1994 and 1995 the UGC decentralised its operations by setting up six regional centres at Pune, Hyderabad, Kolkata, Bhopal, Guwahati and Bangalore. The head office of the UGC is located at Bahadur Shah Zafar Marg in New Delhi, with two additional bureaus operating from 35, Feroze Shah Road and the South Campus of University of Delhi as well. When talking of UGC, it is the apex body that approves universities in the country. UGC provide funds for affiliated universities and colleges.

The UGC also conducts exams, known as NET, for appointing teachers in colleges. The headquarters of UGC is in New Delhi, and there are six regional offices at Hyderabad, Pune, Kolkata, Guwahati, Bhopal and Bangalore.

First of all UGC acronym stands for University Grants Commission, India. It is a statutory body that was started in 1956. It was set up by the Union Government of India to ensure that the standard of the University education in India is maintained. Professor Ved Prakash was heading this institute when it started and he was a great academician.

The UGC has its headquarters in New Delhi. As of today the offices can be located in all the major cities including Kolkata, New Delhi and Bangalore. Post independence the government of India thought that education must be given the maximum importance from the elementary education to the highest levels of education such as the PhD degree.

This is exactly why they wanted to come up with a body that will ensure that the education in India meets a certain standard. The UGC was originally looking into Aligarh University, Benaras University and Delhi University. In 1957 almost all the universities came under the control of the UGC. It is the only grant giving institute in the country. It provides funds and it also arranges for the coordination

and maintenance of the universities in India. The UGC controls the following in India:

- Maintaining the standard of research, teaching and examination in the universities.
- Promoting university education
- Making regulations to maintain the minimum standard of education in the country
- It is a link between the union government and the institutes of higher education
- It also advises the government about the steps to be taken in order to improve the education system.

UGC plays a vital role in the education of the country. It has ensured that a system it followed in higher education. UGC also ensures that the education in all these top universities is of the same standard so that the students passing out of these colleges can be considered equal.

3.5 Indira Gandhi National Open University (IGNOU)

It established by an Act of Parliament in 1985, has continuously striven to build an inclusive knowledge society through inclusive education. It has tried to increase the Gross Enrollment Ratio (GER) by offering high-quality teaching through the Open and Distance Learning (ODL) mode.

The University began by offering two academic programmes in 1987, i.e., Diploma in Management and Diploma in Distance Education, with strength of 4,528 students. Today, it serves the educational aspirations of over 3 million students in India and other countries through 21 Schools of Studies and a network of 67 regional centers.

The mandate of the University is to:

Provide access to higher education to all segments of the society;

Offer high-quality, innovative and need-based programmes at different levels, to all those who require them;

Reach out to the disadvantaged by offering programmes in all parts of the country at affordable costs; and

Promote, coordinate and regulate the standards of education offered through open and distance learning in the country.

To achieve the twin objectives of widening access for all sections of society and providing continual professional development and training to all sectors of the economy, the University uses a variety of media and latest technology in imparting education.

Vision

"The Indira Gandhi National Open University, the National Resource Centre for Open and Distance Learning, with international recognition and presence, shall provide seamless access to sustainable and learner-centric quality education, skill up gradation and training to all by using innovative technologies and methodologies and ensuring convergence of existing systems for large-scale human resource development, required for promoting integrated national development and global understanding".

The University has made a significant mark in the areas of higher education, community education and continual professional development.

The University has been networking with reputed public institutions and private enterprises for enhancing the educational opportunities being offered by it.

As a world leader in distance education, it has been conferred with awards of excellence by the Commonwealth of Learning (COL), Canada, several times.

The University is committed to quality in teaching, research, training and extension activities, and acts as a national resource centre for expertise and infrastructure in the ODL system.

The University has established the Centre for Extension Education, National Centre for Disability Studies and National Centre for Innovation in Distance Education, to focus on specific learner groups and enrich the distance learning system.

Emphasis is now being laid on developing interactive multimedia and online learning, and adding value to the traditional distance education delivery mode with modern technology-enabled education within the framework of blended learning.

Over the years, IGNOU has lived up to the country's expectations of providing education to the marginalized sections of society. Free of cost education is being provided to all jail inmates across the country. A large number of SC/ST students have been admitted to various programmes of the University.

Teleconferencing

IGNOU conducted the first 10-day teleconferencing experiment for distance education in October 1993 through extended C-Band (see Figure 2.1) and satellite uplink support provided by the Indian Space Research Organisation (ISRO) with the help of a TRACT (transportable remote area communication terminal a mobile uplink facility), in which the potentiality of non-print media components came to fore front of programme design and delivery, and the issue of interactivity came to sharp focus. The teleconferencing experiment was based on the preceding two-way audio-conferencing system established at IGNOU in 1993, and which was supported by the Commonwealth of Learning (this though has been dormant now). The audio-conferencing system was improvised with one-way video and two-way audio teleconferencing system. The teleconferencing

system connected the IGNOU headquarters, IGNOU regional centres and state open universities, and enabled all the participating nodes to communicate in a conferencing mode through the two-way audio links and communication through STD lines. The experiment involved 10 sites, i.e. regional centres of IGNOU, and the respective regional directors, assistant regional directors and academic counsellors with the objective of gaining insights into the technical feasibility, organisation and managerial aspects, academic aspects and the cost of operationalising the system on a regular basis.



During the experiment, the system permitted interactivity, though the operation was not smooth. There was administrative and technical problems; STD was not always available and the students sometimes did not get change to avail of this opportunity; and the design of the teleconferencing was in question. All kinds of academic programmes were fed into it, the prominent were the undergraduate degree programmes for which there was not much response from the receiving ends. Perhaps, as was realized subsequently, teleconferencing with 'selective' programmes would have been more successful.

The experiment of 1993 led to its regular use by IGNOU and other organizations for education, training and business meetings since 1995. For IGNOU, it is used for tele-teaching, tele-counselling, tele-training, tele-discussion and extended contact programmes. The studio at the headquarters contains three-camera set-up, scanner for graphics, facilities of special effects, video play back, computer interface, three dedicated phone lines in the control room, a fax machine for receiving participant's queries, and presentation facilities like white board and PC (with power point facility). The programmes (audio and video signals) passed through the TRACT which converted the signals to extended C-Band frequencies and uplinked to INSAT-2C, which in turn threw signals to the various receiving ends/nodes (substantially for IGNOU, and about 250 owned by other user organisations). Also, as a back-up, a second uplink facility was available at the Space Applications Centre of ISRO at Ahmedabad. The interactive system was functional for nearly 20 days in a month for about eight hours (with 60-90 minutes a session). While almost all the academic programmes of IGNOU found slots in teleconferencing, the highest number of tele-counselling-sessions was conducted by the School of Management Studies for the MBA programme.

Though many non-IGNOU organisations and agencies used the facility, IGNOU used it regularly for 246 hours in 1995, 483 hours in 1996 and 495 hours in 1997, the figures for non-IGNOU agencies during this period were 129 hours, 307 hours and 234 hours respectively. The figure in terms of hours of use has increased subsequently.

While the teleconferencing was stabilizing, a local cable TV experiment was conducted at Modasa, Gujarat state which proved very useful in utilising local facilities for ensuring interactivity. Even today, the local cable operator in the city telecasts IGNOU programmes to the households. Due to the failure of extended C-Band of INSAT-2C, teleconferencing was suspended for sometime. This was subsequently revived and made digital through INSAT-3B and later through INSAT-3C.

Interactive radio counselling

IGNOU got into IRC in May 1998 as an experimental programme for one year conducted at the Bhopal AIR. IRC intended to bridge the gap between the institution and the learners through instant response to their queries, as also provide interactive academic counselling on subject areas. The lecture presentation is made at concerned radio station as well as the audio studio of IGNOU; the students at their home or workplace can listen to the presentation, ask questions through a toll-free number in their phone; and both the presenter and the students from all over the country can listen to each other. In March 1999, IRC was extended to 8 other AIRs (Lucknow, Patna, Jaipur, Shimla, Rohtak, Jalandhar, Delhi and Jammu). Today, 184 radio stations across the country broadcast programmes for one hour every Sunday (4.00 to 5.00 p.m.); students from 80 cities can avail the toll-free telephone facility. The AIR slots time, the EMPC coordinates the activities, and the Regional Services Division (RSD) of IGNOU handles the interactive counselling. During the first and third Sundays of the month, AIR stations of Delhi (in Hindi) and Kolkata (in English) broadcast IRC programmes from the national hook up, which 186 radio stations relay either of them. On the fourth Sunday, the programmes are slotted for the state open universities and are broadcast from the AIR stations of Ahmedabad, Bhopal, Bangalore, Patna, Jaipur, Kolkata, Hyderabad and Mumbai. IRC was designed to focus on interactive counseling on subject areas, though the highest number of questions received from learners were found to be more managerial and logistical. However, as was evident in the last few years, the (toll free) radio phone-in counselling had reduced student queries generally raised f2f at study centres and regional centres, and provided encouragement to students to progress on their courses.

Gyan Darshan

Gyan Darshan (literally meaning 'knowledge vision') represents the aspirations of the knowledge society to have a full dedicated educational channel in this country for educational and developmental programming. It was launched jointly by the Union Ministry of HRD, Prashar Bharati and IGNOU (the latter being the nodal agency for uplinking/transmission). Educational programmes for GD are contributed by IGNOU, UGC-CEC, NCERT-CIET, as also by National Open School, Department of Adult Education, and some governmental and non-educational organisations. The programmes are uplinked from the earth station at IGNOU and downlinked all over the country through INSAT-2B. Launched on January 26, 2000 as a 2-hour channel for daily transmission, the duration increased in 2000 to 9 hours in February, 18 hours in June, 19 hours in

November, and 24 hours in January 2001. Though the trial transmission started with 3-8 metre antenna, it increased to 7.3 metre when it was fully commissioned. Since the channel is not terrestrial, it is available through various cable operators all over the country; and attempt is being made to have nodal transmission from Mumbai, Ludhiana and Bangalore. Toll-free facility of 1-600-1-12345 has been extended to 40 cities. It is also available to class X and XII students. Coaching institutions are also invited to join Gyan Darshan to receive television support in terms of telecast of produced programmes, telecast of live programmes, and their sponsorship of programmes. The signal for GD is available on INSAT-2B C-12 transponder, 4170 MHz downlink frequency, vertical polarisation 93.5 degrees east.

Though an essential educational media, the decision on establishing Gyan Darshan was handed down from the Ministry, rather than being born out of any academic need. IGNOU is at the mercy of the cable operators; though it is a satellite channel, cable operators have not been much favourable to it − it is not a viable business proposition for them. The operators are facilitated financially through ads, reimbursement and such other means so as to hold on to it for the larger benefit of the educational community. The cable transmission covers about 90% in Kerala, parts of Tamil Nadu, some pockets in the North East, Nashik, Ahmedabad, Delhi and Pune. The Asianet has been providing it free of cost in Kerala. It is claimed that the programmes go to 40 million cable homes in the country. The added benefit to cable operators is that other Doordarshan channels like DD-Marathi, DD-Gujarati, DD-Kanada and DD-Malayalam come free with Gyan Darshan. Efforts are being made to make GD available through terrestrial transmission; and the Government of India may make it compulsory for private DTH cable operators to provide GD. When Doordarshan shall have DTH operation, GD may form a part of that bouque. While this may liberate the channel from the clutches of the cable operators, the unit cost for shifting to DTH receivers will still be high for many to afford. Now six channels are available on the GD: separate dedicated channels for higher education (Vyas Channel launched on January 24, 2004), technical education (Ekalavya Channel), agricultural education (Kisan Channel launched on January 21, 2004), distance education, and language education (Bhasa Mandakini launched on September 5, 2003, and telecast on DD1 from 6.30-7.00 a.m., 7.15-7.45 a.m. and repeated 12.00-1.00 p.m). Further, the upcoming EduSat (i.e. a dedicated satellite for education) shall boost educational broadcasting in the country. The downlink facility offered at IGNOU covers many parts of the globe, and IGNOU’s overseas partner institutions have been able to regularly view the GD programmes.

3.6 The National Institute of Open Schooling (NIOS)

Formerly it is known as National Open School (NOS). NIOS is providing a number of Vocational, Life Enrichment and community oriented courses besides General and Academic Courses at Secondary and Senior Secondary level.

It also offers Elementary level Courses through its Open Basic Education Programmes (OBE). Government of India through a gazette notification vested NIOS with the authority to examine and certify learners registered with it up to pre degree level courses whether Academic, Technical or Vocational.

Vision: Sustainable inclusive learning with universal and flexible access to quality school education and skill development.

Mission:

Providing relevant, continuity and holistic education up to pre-degree level through Open and Distance Learning System.

Contributing to the Universalisation of school education.

Catering to the educational needs of the prioritized target groups for equity and social justice.

NIOS are committed to provide Excellent, Sustainable, Inclusive and Flexible Education up to Pre-degree level through Open & Distance Learning (ODL) mode & Compliance of requirements to ensure satisfaction of learners and continual improvement of our Quality Management System.

e. SIET (State Institute of Education Technology)

The state Institute of Educational Technology, SIET was constituted by Government of India in all the State with an intention to promote the level of learning and also to educate the student's with the help of Radio and Television.

SIET in Kerala, the state institute of educational technology is responsible for the planning, research production and evaluation of educational software like video, audio programmes and computer multimedia.

SIET Kerala also aims to implement scheme to generate teaching technology and process in the modern context. SIET Kerala is the latest in the array of 7 SETS in the country. Department of Education, ministry of Human Resource Development, Government of India sanctioned the state institute of educational technology for Kerala in 1998. It works as an agency under the Department of Education, Government of kerala.

The institute has adopted itself to play a catalytic role in fostering as well as supporting and supplementing the educational movement in the state particularly in the arena of Primary education. Its area of operation covers the preparation of video/ audio programmes for the children of 5 to 17 years of age (Class 1 to Class 12) and the teachers in the regional language in the form of supportive factor for the conventional class room teaching.

Audio Visual Research Centre (AVRC)

In 1984 University Grants Commission (UGC), New Delhi has launched Country Wide Class Room (CWCR) and production facilities at 6 Universities in India through establishing media centers in the name of Audio Visual Research Centers (AVRCs). Later these centers have been renamed as Educational Multimedia Research Centers.

This was mainly to use electronic media for the quality enrichment of higher education. In 1996- 97, the centre produced 16 educational programmes covering various aspects like earth science, ecology, maths, chemistry & social science etc..The centre also undertakes research in all aspects of educational technology in relation to learning for both urban and rural college.

Objectives

To map the audience profile in terms of demographic, socioeconomic & educational background along with their media habitats.

To examine whether it helps the teachers in higher education by enabling them to teach more effectively.

g. Educational Multimedia Research Centre (EMRC)

It was established as audio visual research centre in 1989 by the UGC CEC at Panjab University Patiyala under the country wide class room project.

Objectives

Production of educational programmes and related support material and setting up of appropriate facilities for this.

Research related to optimizing the effectivness of the programmes

Providing a forum gor the active involvement of acedamic and other scholars in the creation of approptiate educational programme

Studying promoting and experimenting with new techniques/ technology that will increase the research and or effectiveness of educational communication.

The centre is presently funded by the UGC and MHRD for producing enrichment educational video lecture and e. content programmes

The centre is equipped with a large state of the art studio with chroma facility latest technology broadcasting equipment and high powered multimedia workstation to produce educational video content.

The National Institute of Science & Technology (NIST)

NIST was established in the year 1996 by a group of academicians educated in the top Institutes of India and abroad. The founder Director is Prof. Sangram Mudali left USA to establish a world class Institute in their home state of Orissa. Within a few years the reputation of the Institute spread far and wide.

The Institute has received a number of grants, projects, special funding, travel funding, SDPs. FIST grant scholarships, etc., from DST, CSIR, AICTE, IT companies. Etc.

NIST'S Mission was to create an educational institution for nurturing quality engineers and Managers for growth of Indian Industries. To develop Entrepreneurs, to pursue Innovative research on emerging technologies for the future generation and to create engineering minds capable of mastering the global challenges of tomorrow's technology.

i. Satellite Instructional Television Experiment (SITE)

SITE was an experimental satellite communications project Launched in India in 1975 by National Aeronautics and Space Administration (NASA), USA &ISRO. The project made available information television programmes to rural India. The main objectives of the experiment were to educate the poor people of India on various issues via satellite broadcasting &also help India gain technical experience in the field of satellite communications. The programmes under the SITE were classified into 2 categories.

1. Educational Television (ETV)
2. Instructional Television (ITV)

ETV programmes mainly focused on school children in the age group of 5- 12 years. It makes the education more interesting, creative, purposive & stimulating & also creates awareness in the changing society. ITV is mainly for adult audience & cover incidents of national importance for improved practices in agriculture, health, family planning etc. & some recreation programme.

Objectives

Gain experience in the development , testing ,& management of satellite based instructional TV system particularly in rural areas.

Demonstrate the potential value of satellite technology in the rapid development of effective communication in the developing countries.

Democrat the value of satellite broadcast TV in the partial instructions of village inhabitants.

UGC-CEC

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centres set up by the University Grants Commission of India.

It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television along with the appropriate use of emerging Information Communication Technology (ICT).

Realizing the potential and power of television to act as means of Educational Knowledge dissemination, UGC started the Countrywide Classroom Programmes in the year 1984. For production of such programmes Media Centres were set up at 6 Universities. Subsequently CEC emerged in 1993 as a nodal agency to coordinate, guide & facilitate such Educational production at the National level. Today 21 Media Centres are working towards achieving this goal under the umbrella of CEC.

Objectives of CEC:

- Close Coordination, facilitation, overall guidance and direction towards the activities of the Media Centres set up by the UGC in various Universities throughout the country.

- Dissemination of Educational programmes through broadcast as well as non-broadcast modes.

- Production of Educational programmes (Audio/Visual and Web Based) and related support material further setting up of appropriate facilities for such production.

- Research activities related to optimizing the effectiveness of such programmes.

- Providing a forum for the active involvement of academic and other scholars in the creation of appropriate educational programmes.

- Studying, promoting & experimenting with new technology that will increase the reach and / or effectiveness of educational communication

Centre for Development of Imaging Technology (C-DIT)

C-DIT is a unique institution with diverse skill sets and achievements in the areas of information and communication technologies and their applications. Founded as an offshoot of Kerala state film and Development Corporation, C-DIT started its operations with two projects founded by government of India-one in the field of research and development in film and electronics technology and another in the area of science and development communication using video.

Vision and Mission- Government of Kerala in the year1988 established C-DIT with a vision to ensure advancement of research, development and training in imaging technology with an implied role in socially relevant science and development communication.

The Mission statement is "'to become the leading service provider and product innovator in new media information technology systems, tools, applications and content development with thrust on deployment of sustainable and appropriate imaging and imaging technology for science and development communication."

Subsequently, C-DIT diversified into Information Technology applications including software development and to providing IT enabled services. C-DIT has been functioning as a Total Solutions Provider in IT and Communication fields mainly in the Government sector for the last decade and a half.

During the last 24 years of existence, C-DIT has achieved many national and international laurels. The video productions of C-DIT cover different genres of development communication, science popularization, education, environmental awareness etc. Several of them have won the state and national awards as well as top recognition at the international festivals. The innovative TV reality show series produced by C-DIT in collaboration with Doordarshan on the achievements of local self governments and on the success stories in school education have won wide acclaim. C-DIT has planned similar series on health care.

The Governing Body of C-DIT headed by the Chief Minister of Kerala as its Chairman and the Minister for Information and Public Relations as its Vice Chairman, have been guiding the activities of C-DIT.

Major Projects

C-DIT job portal – http://www.careerskerala.gov.in

FRIENDS counter at all the 14 district head quarters

Hologram secured certificates for universities

Hologram for Kerala State Beverages Corporation

Computerisation of various organisations/Departments under Govt. Of Kerala, Universities etc.

Malayalam font development and linguistic computing consultancy

Interactive Educational CDs for IT @ School project

R & D work for State and Central Government

AKSHAYA Project

‘Sastra Kauthukam’ and “ Padana Kauthukam’ educational video series

Digital Heritage Archiving Centre for University of Kerala

Music rich website on “Swathi Thirunal’

‘E-adharam’ project for the Registration Department, Govt. Of Kerala

Project for the National Institute of Advanced Legal Studies , Bangalore

LIAS (Library Digitisation and Archiving Software) for the library digitisation of Kerala University Library.

l. EDUSAT

Indian Space Research Organization (ISRO) launched the India’s first 1950kg, Educational Satellite, EDUSAT, on September 20, 2004 into the Geosynchronous Transfer Orbit; the face of Indian Education is a set to undergo a change.

The EDUSAT as it is being called is going to have 72 channels ready to be beamed from the height of 36,000miles (i.e., from its geo-stationary orbit location).The entire program preparation constituted three stages.

The first stage is already in operation with ku-based transponder on the board INSAT-3B being used a part the pilot project. In the second stage, the satellite would be used in semi-operational mode with at least one uplink in each of the five (Ku-based) spot beams. In this stage, about 100-200 classrooms would be connected to each of them, providing educational programmes to an estimated 50000. This stage is expected to last for about 2 years. In the third stage or the final stage shall be reached when content transmission starts. The proposed satellite is going to give us far greater outreach and connectivity than higher to possible.

It is expected that this satellite would offer instructional facilities in the multi-media mode and video in demand service. EDUSAT is acumination of India’s determined efforts to launch an exclusive educational satellite.

Applications of EDUSAT

This exclusive satellite for education will overcome the death of quality teachers. Concept of education with no classrooms, not teachers and books would become a reality.

Science classes and laboratory experiments too can thus be beamed from a virtual class

A single lecture can reach 10,000 students at the same time.

The lecture can be stored as a computer file and the students can access it according to their convince Audio CD can also be made if necessary.

IT@School

The IT@School Project is an information technology project under the Department of General Education, Government of Kerala in India. Launched in 2001, the Project has remodeled conventional teaching methodologies in classrooms through the use of IT.

The project is being implemented in over 12,000 schools in the state of Kerala, and also in schools in Mahé, Lakshadweep and the Middle East which follow the state syllabus. An estimated 5 million students and 200,000 teachers are now part of this project, which has a network of 160 "master trainers" and 5600 school IT co-ordinators statewide, who are school teachers themselves.

The project also conducts specialized training for visually challenged teachers in that state. The project functions on a free software platform. IT@School Project has rolled out several programmes which included the development of its own Operating System – IT@School GNU/Linux- which is now being used in all the schools in the state.

Apart from this, several educational software like Dr. Geo, Rasmol, K-Tech lab, Geogebra, Chemtool, Kalzium etc. are being extensively customised by the Project in developing teacher friendly applications for facilitating complete ICT enabled education in the state. The project prepared interactive multimedia CDs, handbooks and training modules for ICT, as well as text books for IT. All content developed by the project was per the approach based on the National Curriculum Framework 2005.

VICTERS Channel

India's epoch making first broadband network on EDUSAT for schools VICTERS (Versatile ICT Enabled Resource for Students) – inaugurated by H.E. A P J Abdul Kalam the President of India on 28th July, 2005 in Thiruvananthapuram has revolutionized classrooms through interactive IP based technology.

The scheme which is being executed by IT@School Project of Government of Kerala, is mainly intended to meet the demand for an Interactive Satellite based Distance Education system for the country. It strongly reflects India's commitment to use space technology for national development, especially for the development of the population in remote and rural locations. VICTERS offers interactive virtual classrooms that enable the school students as well as the teachers to directly communicate with the subject experts and educationists.

It also ensures the dissemination of high quality education to the students and teachers from the original source.

VICTERS has two modes of operation – the interactive mode and non interactive mode. Interactive mode of VICTERS is used for video conferencing and other such educational training purposes.

The non interactive mode of VICTERS is the complete educational channel, first of its kind in the country, is unique in the sense that it caters to students & teachers on a need based manner, and programs are aired on demand, sensitive to school curriculum and even timetable. The channel reaches out to as many as 12,500 schools and about 50 lakhs children and covers almost entire households in the State. Target Group

Entire educational community including teachers, students and parents

Various programmes telecast through VICTERS are as follows:

- Padanakauthukam, Shastrakauthukam educational programmes
- Examination oriented programme for SSLC and Plus 2 level
- Shasthramuthukal (Science programmes).
- Vazhikaatti (produced by State Institute of Educational Technology).
- Ormayile Malayalam (Specific datewise regional programme) etc.

Akshaya

The Akshaya project, first started in the rural Malappuram district of Kerala, India, and now spread all around the state, was the first district-wide e-literacy project in India and one of the largest known Internet Protocol (IP) based wireless networks in the world.

In November 2002, the state government of Kerala put into place a project, piloted in Malappuram, with the goal of at least one person in every family to be computer literate in that district. Malappuram is now what is said to be India's First E-literate District.

The mission continues to make Kerala the First E-literate state in India.

In Malappuram district alone, Akshaya has conducted one of the world's largest computer literacy drives, claiming to reach over 600,000 households, representing more than 3.6 million people, in less than 6 months. The project has created a unique brand of state-funded computer access centers, and simultaneously led to a massive wireless infrastructure, providing a wide range of services and making way to many future opportunities.

The project offers lots of services like: E-Pay (electronic payment of utility bills like electricity, land phone, drinking water, university fees etc.); E-Krishi (for farmers to provide online agriculture trading and information portal, A to Z Solution) E-Vidya (advanced IT learning for e-literates and others); E-Ticketing (online train, flight, bus ticket reservations); PMRY online registration; online passport registration; a village kiosk for transparent collectorate program, online communication providers for expatriate Indians; an online medical transcription course, with extension programs for all the above-mentioned services.

P. GYAN DARSAN

Indian DD Gyan darshan is an educational television channel that relays programmes from various Dooradarshan Kendras in different languages. The channel is organized & administered by NCERT, IGNOU & The National

Institute of Open Schools. IGNOU Ministry of Human Resources Development & Prasar Bharti started the channel in January 2000.

Gyandarshan was born on January 26, 2000. It is a bouquet of six channels. In essence, it is a co-operative venture with the Indira Gandhi National Open University as a nodal agency for coordinating the activities & up-linking the educational content.

The programmes are mix blend of core curriculum based programmes in the areas of primary, secondary, higher, open & distance education, extension, technical & vocational education along with general mosaic programmes in areas of health, hygiene, arts, culture, environment, conservation, sciences popularization etc.

There are state wide initiatives such as the SAPNET (Society for Andhra Pradesh Network) in Andhra Pradesh & University of Goa.

SAPNET is a major communication infrastructure initiative of the department of IT & C, Government of Andhra Pradesh. SAPNET is mandated to run 5 television channels (under the name MANA TV) & one data channel.

The programmes are telecast on Gyandarshan from 6am to midnight & also on DD1 & DD2.

One of the most popular programmes of the channel is Nitter, which is an educational program that keeps pace with the improvement in the areas of technology hosted by National Institute of Technical teachers training & research.

q. INFLIBNET

A Gate way to India's Academy and Research Community

Information and Library Network (INFLIBENT) centre is an autonomous inter-university centre (IUC) of University Grants Commission (UGC) involved increasing infrastructure for sharing of library and information resources and services among academic and research Instructions. INFLIBNET works collaboratively with Indian university libraries to shape the future of the academic libraries in the evolving information environment. It is a major National Programme initiated by the UGC in 1991 with its Head Quarters at Gujarat University Campus, Ahmedabad. Initially started as a project under the IUCAA, it became an independent Inter-University Center in 1996. INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centers in the country through a nation-wide high speed data network using the state of art technologies for the optimum utilization of

information. INFLIBNET is set out to be a major player in promoting scholarly communication among academicians and researchers in India.

Objectives

The primary objectives of INFLIBNET as envisaged in Memorandum of Association are:

1. To promote and establish communication facilities to improve capability in information transfer and access, that provides support to scholarship, learning, research and academic pursuit through cooperation and involvement of agencies concerned.

2. To establish INFLIBNET: Information and Libraray Network a computer communication network for linking libraries and information centers in universities, deemed to be universities, colleges, UGC information centers, institutions of national importance and R & D institutions, avoiding duplication of efforts.

Functions

In order to fulfill the objectives, INFLIBNET will do the following:

1. Promote and implement computerization of operations and services in the libraries and information centers of the country, following a uniform standard.

2. Evolve standards and uniforms guidelines in techniques, methods, procedures, computer hardware and software, services and promote their adoption in actual practices by all libraries, in order to facilitate pooling, sharing and exchange of information towards optimal use of resources and facilities.

3. Evolve a national network interconnecting various libraries and information centers in the country and to improve capability in information handling and service.

4. Provide reliable access to document collection of libraries by creating on-line union catalogue of serials, theses/dissertations, books, monographs and non-book materials in various libraries in India.

5. Provide access to bibliographic information sources with citation and abstracts through indigenously created database of the Sectional Information Centers of NISSAT, UGC Information Centers, City Networks and such others and by establishing gateways for on-line accessing of national and international databases held by national and international information networks and centers respectively.

6. Develop new methods and techniques for archival of valuable information available as manuscripts and information documents in different Indian Languages, in the form of digital images using high density storage media.

7. Optimize information resource utilization through shared cataloguing, inter-library loan service, catalogue production, collection development and thus avoiding duplication in acquisition to the extent possible.

8.Enable the users dispersed all over the country, irrespective of locations and distance, to have access to information regarding serials, theses/dissertations, books, monograph sand non-book materials by locating the sources where from available and to obtain it through the facilities of INFLIBNET and union catalogue of documents

3.7 State ET Cells

ET cell has been established as a project sponsored by the MHRD, Govt. of India with an objective to increase the effectiveness of teaching-learning process with the help of modern audio-visual equipment and Information and Communication Technology(ICT). Presently, the cell mainly manages and maintain the Internet Connectivity to the Institute, Local Area Network(LAN), Wi-Fi LAN, and Server Firm, and different Services. The Cell consists of processing laboratory, seminar room, and board room that are well equipped with the state of art audio-visual equipment. These are used for Seminars, Conferences, Workshops and special lectures by faculty members and professionals from institutions and industries. The department has Educational Technology cell (E T Cell) to lend relevant technological support to the ongoing instructional activities as well as the in-service education programmes. It has a rich library of educational films, film-strips, video recording and audio cassettes besides the requisite hardware. There is TV viewing room to watch telecasts / video Playbacks of educational programmes. The ET Cell has a modern audio studio with a spacious recording room and other production facilities. In the last few decades, the E T Cell has developed more than 400 audio programmes in the areas of language teaching value education, child psychology, astronomy, guidance and counseling, etc., for use by students, teacher and teacher trainers. The Cell has undertaken collaborative projects with the States in the region for curriculum based audio cassettes which are subsequently distributed to the beneficiaries by the States.

Currently, the studio is equipped with the facilities of digitalizing the video and audio cassettes. The functions of the ET cell are: To provide audio resource support to the pre and in-service training programmes of the Institute; and To develop prototype audio educational software and E-content in different subject areas for school education for wider dissemination to schools, teacher education institutions and State level organizations.

The Studio is also equipped with recording and editing facilities of E-lessons. The cell is assigned with the responsibilities of producing E-Content in various subjects at different levels of school education and teacher education courses.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. Define CIET

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2. Define IGNOU?

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3.8 LET US SUM UP

In this unit you have learnt the concept of Resource centers for Educational Technology.

3.9 UNIT- END- EXERCISES

1. Define vision and mission of NOS.

3.10 ANSWER TO CHECK YOUR PROGRESS

Vision: Sustainable inclusive learning with universal and flexible access to quality school education and skill development.

Mission:

Providing relevant, continuity and holistic education up to pre-degree level through Open and Distance Learning System.

Contributing to the Universalisation of school education.

Catering to the educational needs of the prioritized target groups for equity and social justice.

3.11 SUGGESTED READINGS

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UNIT IV INFORMATION AND COMMUNICATION TECHNOLOGY

Structure

4.1 INFORMATION AND COMMUNICATION TECHNOLOGY(ICT)

Information and communication technology is defined as the use of hardware and software for efficient management of information. i.e. storage, retrieval, processing, communication, diffusion and sharing of information for social, economical and cultural up liftment. Information and communication technology (ICT) is defined as the implementation of different branches of technology in information and communication processing. In a broader sense, ICT is taken to refer to the whole set of enabling technology concerned with communication, manipulation of information (hardware and software), networking, data storage, transmission –encompassing data ,voice and video.

4.1.1 Meaning and Concept of ICT

ICTs stand for Information and Communication Technologies and are defined, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony. Information and Communication Technologies consist of the hardware, software, networks, and media for collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services. ICTs can be divided into two components, Information and Communication Infrastructure (ICI) which refers to physical

telecommunications systems and networks (cellular broadcast cable satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television), and Information Technology (IT) that refers to the hardware and software of information collection, storage, processing, and presentation. For the purposes of this policy, Information and Communication Technologies are defined as all digital devices, tools, content and resources, which can be deployed for realizing the goals of teaching-learning as well as management of the educational system. According to National Research Council, Learner-centered environment is where "the careful attention is paid to knowledge, skills, attitudes and beliefs of the learners in the classroom". ICT finds its use in education for the following reasons:

- ICT assists students in accessing digital information
- ICT promotes collaborative learning in a distance-learning environment
- ICT offers opportunities to develop critical thinking skills.
- ICT produces a creative learning environment.
- ICT improves the quality of teaching and learning.
- ICT supports teaching by facilitating access to course content.
- Scope of ICT

ICT has a vast scope in the field of education. At all levels of education, whether at school or college, ICT has promising results. These encompass the areas such as teaching- learning in and outside the classroom, in regular face-to-face set-up or distance mode. Thus, the scope of ICT in education can be discussed in detail under the following sections.

Use of ICT in teaching-learning process:

The common use of ICT for teaching includes preparation for notes, teaching learning resources and examinations. This does not enable teachers to radically change their pedagogical practices. Teachers need to go beyond such simple use by involving students to use ICT so as to transfer students' learning. The best way of using ICT by teachers in teaching-learning process is to see that students are motivated to use technology which takes care of concentration on technology or on the teacher at a given time in the classroom.

Use of ICT for Publication purposes:

The educational uses of ICT for publication purpose is mainly to disseminate information or ideas and share them with the school community, public, governmental organizations within the country or abroad. These products of publication take the shape of a newsletter, brochure or a website. Students can publish a newsletter by procuring the information related to an organization-Governmental or Non-Governmental. While taking up publishing work, student play roles such as editors, reporters, authors and designers of the newsletter. Later they also plan, design, create and distribute them in and outside the school for the people concern.

Use of ICT in Evaluation:

Evaluation is a significant part of teaching which comprises the learning process and also the provision feedback to learners. Teachers in traditional face-to-face situations use interaction as an opportunity to provide feedback to learners, besides communicating their strength and weaknesses. With the advent of technological developments, there is limited opportunity for face-to-face Interaction. Now, teacher uses a combination of two forms of evaluation: Formative Evaluation: This is used as a learning tool, and to give and gain feedback on learner ability and performance. Summative Evaluation: This is an evaluative method for grading and making a judgment about the participant's achievement in a course. Formative evaluation can take the form of any one or many of the following types of assignments:

- Portfolios: Portfolios are the collection of a student's work over a period of time. They take the form of action plan with out comes which is at various stages of implementation; a series of paintings with student self-reflection; or a collection of essays accompanied by an annotated bibliography and critique.
- Reports, essays and journals: These belong to specific kind on interest. These are aimed at developing critical thinking skills and to make judgments about various actions, plans, ideology, movements in history or a discipline specific collection of readings.
- Case studies and scenarios: These are used to develop analytical skills based on a specific area or knowledge.

- Online (asynchronous) conference discussions and synchronous oral examinations: These evaluation techniques favour learners who are skilled in presenting thoughts and ideas through inter-personal interaction.

Use of ICT for Research purpose:

Products and processes of ICT provide access to a lot of information on innumerable topics produced by people of diverse areas and fields across the globe. This information is either singled out in combination of the form of text, images, sounds, videos and animation. For research, sifting through a number of websites in search of relevant, authentic and high quality information is a challenging experience. So, while looking for resources one of the easiest and safest methods of researching is to use directories. These aspects lead to collaboration of research work in which the different areas or processes of the research project can be shared to produce quality results and achieve the desired goals.

Use of ICT for Administration:

ICT for administration purposes include the preparation of school announcements, reports, letters and student registration. ICT makes the work of the heads of school easy and manageable and document storage saves a lot of space, as physical files are replaced by electronic ones.

Use of ICT for Personal Purposes:

At the personal level, ICT is used for communication, personal development and entertainment purpose. Again, most usage will be to search for and store information, and submit online application-subscription, purchase or other personal uses.

Use of ICT for Professional development: ICT uses for professional development is indicated in searching for information for self-study and communication. This enhances teacher's confidence in their areas of specialization. To further their teaching career, few teachers use ICT and consequently motivate others to use ICT.

4.1.2 Characteristics of ICT

The characteristics of ICT in education can be discussed in detail under the following headings:

Student-centric:

In these classrooms, students play an active role in their learning and teachers serve as mere guides. They are more facilitators of learning than lecturers.They help students think critically and learn by doing and act as a resource while their students discover and master new concepts. Student-centric classroom environments put students' interests first and are focused on each student's needs, abilities and learning styles.

Computing devices:

Computers are readily available in modern classrooms, since they are essential tools for 21st century students and replace the utilities of pen and paper. They not only give students the means to conduct online research and master the technology skills they need, but they also give teachers the opportunity to enhance their lessons. The ability to deftly operate a computer is a critical 21st century skill. Computing devices greatly assist in teaching and learning and make them more engaging and effective.

Active learning:

In modern classrooms, students are actively engaged in what they learn. Students participate in more active learning by working in groups or on computers and complete projects and other interesting activities that help them discover new skills. Students can learn actively by talking and listening, writing, reading and reflecting. When students are encouraged to take an active interest in learning, they are more likely to retain the knowledge they've accumulated.

Adaptive learning:

Any classroom will always have students of different types of learning abilities in it which often makes it difficult for teachers to make sure that all of them understand the concepts. The modern approach of adaptive learning gives students the freedom to learn at their own pace and in the way they are most comfortable with. There are various kinds of software available for adaptive learning that teachers can use to enhance the learning of their students.

Invitational environment:

The classrooms should not be cramped or overcrowded. Modern classrooms should have the basic material required for teaching such as, interactive whiteboards and LCD projectors. The BYOD (Bring-Your-Own-Device) approach can be adopted, so that students can bring their laptops or tablets to the classroom for better personalized learning. Teaching with technological material is more effective, stimulates student engagement, eases the work of teachers and makes it easy for students to focus on learning.

4.1.3 Application of ICT in Classroom Instruction

The National Policy on Education 1986, as modified in 1992, stressed the need to employ educational technology to improve the quality of education. The policy statement led to two major centrally sponsored schemes, namely, Educational Technology (ET) and Computer Literacy and Studies in Schools (CLASS) paving the way for a more comprehensive centrally sponsored scheme – Information and Communication Technology @ Schools in 2004. Educational technology also found a significant place in another scheme on upgradation of science education. The significant role ICT can playing school education has also been highlighted in the National Curriculum Framework 2005 (NCF) 2005. Use of ICT for quality improvement also figures in Government of India's flagship programme on education, Sarva Shiksha Abhiyan (SSA). Again, ICT has figured comprehensively in the norm of schooling recommended by the Central Advisory Board of Education (CABE), in its report on Universal Secondary Education, in 2005. With the convergence of technologies, it has become imperative to take a comprehensive look at all possible information and communication technologies for improving school education in the country. The comprehensive choice of ICT for holistic development of education can be built only on a sound policy. The initiative of ICT Policy in School Education is inspired by the tremendous potential of ICT for enhancing outreach and improving quality of education. This policy endeavours to provide guidelines to assist the States in optimizing the use of ICT in school education within a national policy framework.

Aim:

- The ICT Policy in School Education aims at preparing youth to participate creatively in the establishment, sustenance and growth of a knowledge society leading to all round socioeconomic development of the nation and global competitiveness.
- It also aims to devise, catalyse, support and sustain ICT and ICT enabled activities and processes in order to improve access, quality and efficiency in the school system

Objectives:

To achieve the above, the ICT Policy in School Education endeavours to:

Create

- ✓ an environment to develop a community knowledgeable about ICT
- ✓ an ICT literate community which can deploy, utilise, benefit from ICT and contribute to nation building
- ✓ an environment of collaboration, cooperation and sharing, conducive to the creation of a demand for optimal utilisation of and optimum returns on the potentials of ICT in education

Promote

- ✓ universal, equitable, open and free access to a state of the art ICT and ICT enabled tools and resources to all students and teachers
- ✓ development of local and localised quality content and to enable students and teachers to partner in the development and critical use of shared digital resources
- ✓ development of professional networks of teachers, resource persons and schools to catalyse and support resource sharing, upgradation, and continuing education of teachers; guidance, counselling and academic support to students; and resource sharing, management and networking of school managers and administrators, resulting in improved efficiencies in the schooling process
- ✓ research, evaluation and experimentation in ICT tools and ICT enabled practices in order to inform, guide and utilise the potentials of ICT in school education
- ✓ a critical understanding of ICT, its benefits, dangers and limitations

Motivate and enable

- ✓ wider participation of all sections of society in strengthening the school education process through appropriate utilization of ICT

4.1.4 Effective Classroom Communication

Effective communication is the essential requirement for the success of teaching learning activities of any classroom. Therefore, for all practical purposes, the teacher should invariably try for achieving utmost efficiency and effectiveness in the process of classroom communication and interaction with the students. For this purpose necessary improvement should be made with regard to the contribution of each factor and component related with the process and mechanism of classroom communication. Let us think about the role of these components on these lines.

Source of Communication: Effectiveness of classroom communication very much depends on the strengths and qualities of the sources of communication i.e. teacher. All teachers should therefore try to imbibe the virtues and qualities of an effective communicator or sender of the message. In brief, the following things may contribute in improving the communicator image of a class teacher.

- Sound physical and mental health.
- Proper teacher like dress and mannerism.
- Proper teacher like behavior in dealing with the students.
- Appropriate voice, control and efficiency in the use of language mutually sharable with the students.
- Appropriate mastery over the subject matter, content or message delivered to the students.
- Proper knowledge, skill and efficiency in the use of various media and channels of communication.
- Efficiency in classroom control and response management.
- Efficiency with regard to thinking skills like ability to think and reason well, ability of imagining, creative thinking, analyzing, synthesizing, generalizing or drawing inferences etc.
- Efficiency with regard to the use of audio-visual aids appliances and multimedia.
- Proper attitude towards self-implying that the teacher as a communicator must possess self confidence in his abilities of believing, saying and doing.
- Proper attitude towards the students implying that the teacher should have a sense of respect, understanding and faith in the abilities of the students.

Communication Material: The effectiveness and success of the communication process in any classroom situation very much depends upon the quality and nature of the communication material. If the contents and message has some attraction, force and value to the receiver, it will surely catch his attention and make him quite attentive

and active participant in the communication process. On the contrary, if there is nothing new, novel or valuable in the message or piece of instruction imparted by the teacher, it will neither attract nor motivate the students to take genuine interest for becoming active partner in the ongoing classroom communication. Therefore, it is the prime duty of the teachers to think seriously about the quality and nature of the content material and message given to their students.

Communication Media or Channel: Communication media or channels just lie in between the source and the receiver like a bridge or connecting link. What the teacher says or shows to his students can do it only with the help of some or the other verbal or non-verbal communication means. The nature and quality of the traffic flowing on the bridge is very much dependent on the appropriateness, strength and quality of the bridge. Similarly the effectiveness and strength of the communication flow between the teacher and students will surely depend upon the nature and quality of the verbal and non-verbal means, media and channels employed in the classroom communication. For this purpose the following things should always be kept in mind.

- Use that language which is quite known and under stable on the part of the students.
- The verbal means should be supported by the non-verbal clues, gestures, body language, physical movements etc. for giving required strength and effectiveness to the process of communication.
- To reduce the evil effects of verbalism, attempts should be made to make use of appropriate audio-visual aid material and appliances, suiting to the very nature and timing of the communication.
- Have variety, novelty and creativity in making use of different means and media for the communication of the intended message. Always prefer the multimedia approach over the single or the limited usual means.

Receiver of the Communication: Where the initiator or source of communication is the teacher, students lie on the other end for actualizing the process of communication. Actually what goes inside the classroom communication is always intended for the benefit of the students. That is why, it can only be carried out effectively with their active involvement and cooperation. In case the students are not interested or not capable of receiving and understanding the meaning of the message or do not respond in a proper way for maintaining the flow of communication, the communication, will turn into one side affair and thus lose its purpose and significance. These characteristics of the students for achieving required effectiveness in classroom communication may be summarized as below.

- They must have proper and sufficient previous knowledge and general background for receiving and understanding the communicated message.
- They must have required proficiency and abilities in terms of communication skills like listening, observing, reading, writing, speaking, mapping, drawing, measuring, surveying, thinking,

analyzing, synthesizing, evaluating and drawing inferences,etc.

- They must show proper zeal, enthusiasm, curiosity as well as need for maintaining the chain of communication.
- They must not put themselves into a passive recipient of the information or message given by the teacher but should make themselves, enquirer and active partner in the setup of the classroom communication.

The Environmental Conditions and Situations: The effectiveness of classroom communication also depends upon the appropriateness or inappropriateness of the situation or environmental conditions prevailing at the time of classroom communication. The psychological and physical factors involved in these environmental conditions and situations directly or indirectly influence the efficiency and effectiveness of the teacher (source), students (receivers) and media or channels of communication. Consequently efforts should be made for bringing necessary improvement in the environmental conditions and situations of the classroom communication by adopting the following measures.

- The classroom should be appropriately spacious as to accommodate the required number of students with the seating capacity norms. They should provide appropriate ventilation, lighting sound and seating arrangement along with sufficient space for instructional and communication activities.
- The classroom should be so situated as not to be affected by the outside disturbances, noise,etc.
- The classrooms should have all the necessary arrangement for the use of audio-visual material, equipment and appliances etc. needed for the effective classroom communication.

- As far as possible efforts should be made to have healthy and useful interaction between and among the teachers and students during the classroom communication.
- They should provide necessary encouragement as well as help in removing the communication difficulties and deficiencies by showing necessary sympathy and affection towards the students. Their responses should also be effectively managed and they should be provided with adequate remedial care and look after based on the feedback given by them in the process of communication.

In this way all round efforts are needed on the part of teachers for taking the students with them for the effective classroom interaction and communication by doing all what is needed on their part in terms of improving their own performances as communicator along with bringing necessary improvement in the mains, media and environmental conditions for drawing maximum advantage through the ongoing classroom interaction and communication.

Communicative Skills for Teachers and Students

Teaching is generally considered as only fifty percent knowledge and fifty percent interpersonal or communication skills. For

a teacher, it is not just important to give a quality lecture but it is more important for the presentation of a lesson or lecture in class. Communication skills for teachers are thus as important as their in-depth knowledge of the particular subject which they teach. Teachers should be aware of the importance of communication skills in teaching. They must also realize that all students have different levels of strengths and weaknesses. It is only through communication skills that a teacher can introduce creative and effective solutions to the problems of the students. Thus, a teacher can enhance the learning process. Following are some of the communication skills that a teacher must possess so that they interact properly with the students-

- Positive Motivation: This is one of the important things that a teacher must possess. In a class, students always have different kinds of taste and preferences over subjects. So it is the job of the teacher to create enthusiasm and interest in the minds of the students towards a subject. It is also a teacher's role to remove any fear and inhibitions that a student may have towards a subject.

- Effective Body Language: This is the most powerful communication skill that a teacher must possess. Good presentation skills include a powerful body language supported by verbal skills. This can create a long lasting impression in the minds of the students. Thus, a teachers lectures will inevitably become more interactive and Interesting for the students. Besides, a teacher should maintain the volume, tone and rhythm of their voice during a lecture.

- Sense of Humor: The importance of this factor has been regularly underestimated. A good sense of humor keeps the students active and interested in the teachers' class. A teacher who is dour and lacks humor doesn't contribute to the overall well-being of the students.

- Understanding the Students: Teachers should encourage students to communicate openly. There should be emphasis on cultivating a dialogue rather than a monologue. So, while solving any kind of problems in the classroom, it is always wise to hear the opinions of the students also.

- Team Formation: This is a good method where you can divide the classroom into small teams and ask them to solve different problems or complete assignments. This practice will increase not only the interaction among the students but also among the teacher and students.

- Technical Skills: It is also important that teachers should be up to date with all the latest teaching aids like computers, video conferencing and especially the use of internet. This will also help the students to keep up their interest in the learning process.

Students are the future of every nation. That is why the role of teachers is so important to the society. It is through a teacher that generations of youngsters are deeply influenced. Overall improvement

in a student can be expected when communication skills for teachers is given due importance. Thus, it is important that communication skills

become an important ingredient of a teacher's professional competency.

4.1.5 Difference between ICT and ET

Modern developments in information and communication technologies (ICT) provide exciting possibilities to enhance the quality of education. Interactive education software, open access digital libraries, and cheaper and more intuitive technology may facilitate new forms of interaction between students, teachers, education employees and the community and enhance the quality of education by making it more accessible.

Education may be enriched by integrating such technologies into traditional educational activities. However, it must be recognised that ITC may never displace the relationship between teacher and learner which is crucial to the learning and development process.

ICT has the capacity to enhance the learning process and facilitate communications within education institutions and between educators and learners but it must be used in education institutions under the supervision of qualified well-trained professionals with the expertise in pedagogy and in education to ensure that its impact does not damage or undermine the learning process or the development of learners.

Education unions should

(i) support the use of ICT as an integral part of the provision of quality education for all. They should advocate for the use of ICT in education as a key modern aid to teaching and learning;

(ii) advocate for free access for all teachers and learners, support professionals and administrators in education, to high quality dedicated ICT;

(iii) insist that ICT in education is appropriate to the learning requirements in the curriculum in each subject, is supportive of the work of teachers and learners, and of administrative and professional staff in education;

(iv) insist that educators are consulted about the introduction of ICT into education institutions and involved in the design and development of appropriate ICT for education purposes;

(v) monitor the implementation of any agreements entered into by governments, national education or school authorities for the provision of ICT by commercial companies.

But this doesn't mean that educational technology is same as ICT. It is different from each other by following reasons:

Educational technology (also called learning technology) is the study and ethical practice of facilitating learning and improving performance by

creating, using and managing appropriate technological processes and resources. educational technology includes other systems used in the process of developing human capability. Educational Technology includes, but is not limited to, software, hardware, as well as Internet applications and activities. Whereas ICT are only a part of a continuum of technologies, starting with chalk and books, all of which can support and enrich learning. ICT, as any tools, must be considered as such, and used and adapted to serve educational goals. The purpose of ICT in education is generally to familiarise students with the use and workings of computers and softwares.

Educational technology can be considered either as a design science or as a collection of different research interests addressing fundamental issues of learning, teaching and social organization. it only aims at increased efficiency or effectiveness of current practise, but frequently it aims at pedagogical change. Whereas ICT in education can be broadly categorized in the following ways

ICT as a subject (i.e., computer studies)

ICT as a tool to support traditional subjects (i.e., computer-based learning, presentation, research)

ICT as an administrative tool (i.e., education management information systems/EMIS)

The information processing cycle, in the context of computers and computer processing, has four stages: input, processing, output and storage (IPOS). However, at some levels within a computer, some processing devices actually only use three of these stages -- input, processing and output -- without the need to store data. Each of these stages plays an important role in the collection, analysis and distribution actions performed by a computer system.

Data must enter a system before it can be processed into either stored data or information output. The input stage of IPOS provides the means and mechanisms through which data enters the IPOS model. Some experts believe the input process itself could be divided into as many as three stages: collection, preparation and input. However, the general view of the input stage is that data is input into a system using some form of an input device.

An input device is able to collect data at its source or point of measurement. The source of data entered into the system by a human is through a keyboard, microphone or perhaps even the movement of eyes or another body part. Other forms of input devices, such as thermometers, sensors and clocks, also meet the general definition of input devices. The input stage of IPOS could also be referred to as the encoding stage.

Data Processing

Once data enters the IPOS model, it is processed into either stored data or information. The processing agent is typically some form of software or firmware, with a specific action taken on a particular type of data. In a portable or desktop computer, it is common for the processing agent to be active even before the data enters. In fact, it is also common for the processing software to request data and guide its input process.

Processing can range from relatively small and simple to very large and complex. Regardless, the sole purpose of the processing stage is to convert the raw input data into a form that can be stored for later use or provide information output for further processing or interpretation.

Output Processing

Output processing in IPOS sends information to a display screen, a printer, a plotter, a speaker or some other medium that human senses can interpret.

However, the output stage could store the data in a new format or transform the processed data into an input to another IPOS module as well. For most users, output means either a display on a monitor screen or a printed document or graphic. Output can also mean data, information or coding.

Storage Processing

Storage stage of IPOS can occur directly from or to the processing or the output stages. The storage stage can serve as a pseudo-input or pseudo-output stage for the processing stage. The processing stage may need to store data for later use or recall previously stored data for processing new data from the input stage. The output stage may store processed data as information for display by another IPOS module when needed. The storage stage does not only store data or information on a fixed storage medium, such as a hard disk, but can also store data and information on removable media, such as a flash drive, CD-ROM or DVD.

4.2 The Information Processing Cycle Barriers

a) **Processing rate**

- refers to our ability to process the information that comes to us. Some people can listen to 600-800 words per minute and still make sense out of what the speaker is saying. This difference between our capacities to make sense out of words at the speed at which they register in our critical centres can cause trouble.

Antidote: By periodically sprinkling in mental summaries during a conversation, we can dramatically increase our listening ability and make speech-rate/ thought-rate difference work to our advantage.

b) **Information overload**

– we are constantly bombarded with sights and sound bites, and experts suggest that the amount of information competing for our attention is going to increase in future. Incoming messages and information on computer fax machines, emails, earphones, beepers and other technological devices can interrupt conversation and distract us from listening to others. The amount of information coming to us on any given day wears us out.

Antidote/ strategy: self-awareness. Be on the alert for drifting information due to information overload.

c) **Receiver apprehension:**

this is being fearful of misunderstanding or misinterpreting

information / the messages spoken by others or not being able to adjust psychologically to messages expressed by others i.e. just being fearful of receiving new information and being able to understand it.

If we are fearful or receiving information, we will remember less information.

Strategy: use a tape recorder to record a lecture, which may help you feel more comfortable and less anxious trying to remember every point.

d) Shifting attention:

Research suggests that while women can multitask and attend to multiple messages simultaneously, men tend to lock onto a message.

Implications

- Women should stop and focus on the messages of others rather than on internal or external competing messages.
- Men may need to be sensitive to others who may want to speak to them, rather than become fixated on their own internal message, or a singular external message such as watching sports, a movie etc.

4.3 COMMUNICATION

Communication is a basic prerequisite of all human performance and interaction. In a broad sense communication refers to the transmission of thoughts, information and commands by employing the sensory channels. The art of communication ensures that the message is conveyed intact – undiminished and undistorted. Communication is also considered to be a process of exchange. i.e. give and take of information by message. Communication tries to blend into a mutual understanding of a fact, principle or theory.

4.3.1 Concept and Meaning of communication

Etymologically speaking, the word communication is derived from a root word ‘communis’ which means ‘common’, i.e it reveals that it is an act of sharing commonness or common understanding with others or between two individuals or groups or organizations. In the words of Edgar Dale who created a dent through his case of experiences in the world of audio-visual media. It can be defined as “the sharing of ideas and feelings in a mood of mutuality”.

Communication refers to the transmission of thoughts, information and commands by employing the sensory channels. Communication is a process of sharing or exchange of experiences, information, views, opinions, ideas, sentiments, thoughts, feelings and so on, between the source of communication(sender, teacher, any source of information) and the receiver(receiver, learner, seeker of information) through the same means, media(verbal or non-verbal).

4.3.2 Elements of Communication

The process of communication is dependent on each and every element. To help you understand how the process of communication happens and how these elements are dependent on each other mutually for effective communication, a brief meaning of each element is presented below:

Communication Context: The context could be physical, social, psychological or temporal i.e. Physical: Which includes the dimensions or size of the space,

room, hall orientation or the event which takes place. Social: What kind of social relationships exist among people and how the communication depends on social context. It could be formal, informal etc. Psychological: How an individual communicates at the personal level or otherwise. Temporal: Time also matters, i.e. after a daylong work how it affects, or during mornings, how it would be received, therefore the specific time of the day matters.

Similarly what is the period of time i.e., how is the situation at that period, will make all the difference in communication. So, always, it is the context which plays a very important role in the process of communication.

Source/Sender: Source or Sender can be a person or the event or any other source which can be verbal apart from any other mode. From where the communication begins or starts, can also be the source.

Receiver: A person who interprets the message or receives the information or has been communicated about something.

Message: Verbal or non-verbal cues are sent by a source. They could be words, figures, gestures, movements etc. which forms a message.

Symbol: Symbol is denoted for something else. It can be verbal, non-verbal, words or symbols. E.g: addition is communicated as +, colour for same thing or emotion, red for danger or stop etc.

Channel: A channel or medium through which the matter is conveyed. They could be visual (sight), auditory (hearing), tactile (touch), gustatory (taste), and olfactory (smell). Any such one or through many of the above, the message is sent.

Encoding: Process of using symbols to express the idea or feeling.

Decoding: From the received message it needs to be understood i.e the symbols sent need to be expressed or translated into the ideal. If some symbols are sent as a message, that is translated into the meaning of the same oridea.

Feedback: This feedback gives a clear idea to the sender whether the communication is properly reached or not. It will be known through the response or feedback given by the the receiver to the sender.

Noise: Which distorts the message, it can be external or internal to the source and the receiver.

Functions of classroom communication

Communication in our lives or in any profession is meant to serve a set of functions. This chapter has identified the following four functions as being relevant for classroom communication. Even so, they are not unique to teaching and learning. These are:

i) Understanding and insight
Teachers teach in order to assist their learners understand subject content as clearly as possible. The idea that a learner ought to develop deep insights regarding what they study is key. Deep learning is different from surface level learning. In addition to understanding content, teachers and learners need to understand themselves and each other. Teachers use their understanding of learners to deliver content in ways that meet individual needs. Both teachers need to also understand their environment as this understanding is also suitable for effective learning. Using communication to ask questions that foster reflection is useful in promoting understanding.

ii) Persuasion and influence
The whole process of teaching and learning is one of trying to influence another person. Teachers try to persuade learners and every teacher will influence their learners whether they like it or not. The important question then becomes: what do you say or do in your classroom in order to create a positive influence. Persuasion can take the form of direct words used intentionally to get a learner to do work, answer a question, change behaviour and so forth. Learners need to taught explicitly how they can use communication to influence the teacher, other learners and others in the community. Writing is also a powerful way of influencing others. You may want to think about this: How can your learners write with the intention to persuade and influence (you the teacher) and other relevant audiences? Can you think of how writing influences the examiner when grading tasks?

iii) Promoting learning skills
Traditionally, teaching has been more about the teacher dominating the classroom with teacher talk. Today emphasis is shifting on helping learners become responsible for their own learning. Learners develop their learning skills when a teacher allows them time to speak more, read texts and discuss in groups as well participate in writing tasks that involve summarizing key ideas from what the teacher says or from their reading. Effective communication is a strong enabling factor for learning so the teacher should promote the communication skills of learners. Modeling the learning behaviour you would want your learners to copy is very important. This is done by how you research for new ideas and how you ask questions that require serious attention from learners.

iv) Initiate and maintain relationships
Classroom teaching is interpersonal as well as social in that learners learn best when they have a strong sense of belonging. The teacher should be interested in using communication to promote a social climate where learners work collaboratively. Every learner should feel

valued and respected by the teacher and other learners. You can imagine a classroom where positive human connection was absent. Learning would not occur. Communication in this case should minimize the need for competition and focus on care and support for others. Within this function many educational goals can be supported such as unity, love, cultural diversity, integrity, etc.

These functions apply in many different areas of human endeavour and as such communication skills are regarded as top on the list of 21st century skills Every education system is now challenged to see to it that their development (ref to the 21st Century Skills and Competency Based Curriculum for Kenya) is given attention.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. Define Characteristics of ICT

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2. What are the Difference between ICT and ET.

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4.4 LET US SUM UP

In this unit you have learnt the concept of Information and Communication Technology

4.5 UNIT- END- EXERCISES

1. Define the Application of ICT in Classroom Instruction

4.6 ANSWER TO CHECK YOUR PROGRESS

School can be seen as an institution that both upholds and reforms tradition. School is a sanctuary of closed knowledge, protecting its educational autonomy with every means available. The closed code of school can be contrasted with, for example, the open code of the Internet. For the media-savvy teacher, Communication Technology constitute a never ending source of information and pedagogical challenges, as they provide an opportunity to establish virtual classrooms uniting school classes in different parts the world. In a progressive school, Communication Technology might serve a fundamental pedagogic purpose of generating discussions across all barriers.

4.7 SUGGESTED READINGS

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BLOCK II
ICT IN LEARNING PROCESS, PROGRAMMED INSTRUCTION CONCEPT OF PEDAGOGY AND LEVELS OF TEACHING

UNIT V ICT IN LEARNING PROCESS

Structure

5.1 Introduction

The rapid development of ICT affects the development of technology implementation in every aspect of life, from business, entertainment, socials and education especially. The benefit of ICT's role in education had been realized since 1990's, along with the declining price of PC, the widespread of internet access, the increasing of IT application in the documentation functions, and the availability of animation processing software development. In its early application, ICT in education had been commonly used to support administrative works and services in universities, in which the main goals were efficiency and better quality services for students. Today, ICT has been used to support the core function of a university, that is learning activity. In other perspectives, ICT application in university is encouraged by a change paradigm in the process of learning, that is from Teacher Centered Learning becomes Student Centered Learning or Student Active Learning, and also from broadcasted learning becomes interactive learning. The definition of e-Learning can be stated as "The use of network and multimedia technologies to improve the quality of learning by enabling access to knowledge and remote resources for the development of K-society" . Another definition, e-Learning as "The continuous assimilation of knowledge and skills by adults stimulated by synchronous and asynchronous learning events, and sometimes knowledge management outputs, which are authored, delivered, engaged with, supported and administered using internet technologies " According to Nagy [9] e-Learning refers to learning that depends on or is enhanced by electronic or

online communication using the latest information and communication technology, and according Development Gateway is the application of ICT in support of distance learning, self-guided learning and the traditional classroom There are 4 pillars to support e-Learning : infrastructure, content, professional/ human resources and policy, “unpublished” .Bina Nusantara University (UBiNus) is located in West Jakarta and has more than 23.000 students, grouped into five faculties, namely Faculty of Computer Science, Faculty of Economics, Faculty of Maths, Faculty of Engineering, and Faculty of Letters. Those faculties will be developed in the near future. Along with UBiNus vision : To become a leading ITbased education institution, accepted as the benchmark for other universities, as well as ready for competition and adaptable to global change, ICT applications get a full support from parent organization , the directors, and all academic groups, such as students, lecturers, researchers, and staff. ICT implementations had not only for supporting administrative, services, and managerial activities, but also for teaching and learning activities since the year of 2000 which was called Multi Channel Learning (MCL). Based on the mentioned introduction, this paper discusses many supporting factors in ICT integration in teaching and learning process at Bina Nusantara University.

5.2 Concept and components of ICT

Information and Communication Technology (ICT) in education is the mode of education that use information and communications technology to support, enhance, and optimise the delivery of information.

Worldwide research has shown that ICT can lead to an improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in the use of ICT in education with integrating technology to the curriculum has a significant and positive impact on students’ achievements. The results specifically showed that the students who are continuously exposed to technology through education has better ‘knowledge’, presentation skills, innovative capabilities, and are ready to take more efforts into learning as compared to their counterparts.

Components

1. Data: raw facts/ figures/statistics.
2. Hardware: physical components in a computer or peripherals.
3. Software: names of computer programs.
4. Information: converted data which gives it meaning.
5. Procedures: actions conducted in a serires of a certain order to ensure the system will run smoothly.

6. People: entering data by many different means, e.g. keyboard or voice recognition etc.

5.2.1 Steps Systems Approach to Instruction

Systems approach is a management tool that allows individuals to examine all aspects of the organization, to inter relate the effects of one set of decisions to another and to optimally use all the resources at hand to solve the problem. Systems approach makes it possible to analyse teaching-learning situations for the purpose of taking decisions. The development of systems analysis make it possible to take all the components of a system into consideration, understand

their inter-relationships, perceive alternative solutions and foresee their impact,

and make adjustments when needed through constantly checking results. .The most basic concept of this approach is that no one element exists in a vacuum, but that each always relates to other components of the system. Thus, if one element is altered, the relationships between it and the other factors are potentially affected. This modification places stress on the entire system. If all the interrelated components can be made consistent with the reformed element, the change is accepted, the system restabilizes, and a type of synergy, or effectively directed smooth functioning of the system, results. Similarly in a social system, if the factors that affect learning are connected and supporting each other the resulting effect will be greater than the sum of each factor separately. However, if the reform in one element of the system is inconsistent with all the other components of the system, the change is rejected as the system strives to regulate itself to reestablish a steady state following the disruption. If we want to analyse and understand a teaching/learning situation-in a classroom, school, or group of young people-it is not enough to see it as the product of the activities of a set of individuals with their own objectives and characteristics: we must regard it as a system, that is, as a totality more complex than the mere sum of its constituent parts, because of the interrelationships between them. An instructional situation is not, of course, a system in the sense understood by the general theory of systems for which a system is a set of discrete elements that interact to attain a particular goal. Thus, each system is a coherent and indivisible whole that can be System distinguished from its surroundings. Moreover, this whole is organized since it reflects the dynamic and reciprocal interaction of its various components, and any change in one element will necessarily change others and consequently the entire system. A system cannot be reduced to the sum of its parts, since the latter do not have the same significance when studied in isolation as when seen as contributing to the whole. If we looked at each component separately, therefore, we might miss the factors that constitute the system as such. The systems approach will make each person involved in education, whether student, parent, teacher or senior official, more fully aware how complex learning situations are and give them a clearer insight into the action equired of them at their particular levels of responsibility. The components of the system A system is defined by its components, that is, by its constituent parts and by their interrelationships. Like any system involving a social mode of operation, whether formal or informal, the instructional situation contains a number Product of constants. We shall begin with the product (or output) which, in this case, is what has to be learned (for example, the ability to read). It is in fact by virtue of its affinity to a production process that we can regard the learning situation as a system. The product results from the activities of the class, that is, from interactions between the teacher, the students, the resources and the constraints, via the method used. The input of a given system (a particular learning activity, for example) is made up of the students, who undergo a certain transformation during the process but who may also be regarded as products of the previous situation. Input and output (product) are two principal factors marking the interaction between a teaching learning situation and its environment. But there are also other factors which constantly enter into play, and this is why it is, as we shall see, so difficult to define precisely what a system comprises, where it begins and end. The time and

energy spent by the teacher on preparation for Resources himself and for his students, the time and energy expended by students in learning (their motivation as well as their actual work), the teaching materials, equipment and accommodation, all constitute resources. Regulations, size of class, the teacher's level of training, Constraints national examinations and lack of, or inadequate, resources-in other words, the general conditions governing the institutional, social, cultural, economic or other environment-represent constraints. The way in which the teacher or the students employ the Strategy resources and fight against the constraints or turn them to advantage how, that is, they actually organize the various components defines the educational strategy. How students answer their teacher, their reactions, the reactions Feedback of parents or of his superiors provide the teacher with information and evaluation from which he can assess the results of his efforts and change his strategy where necessary. This return flow of information is called feedback. This feedback helps the teacher to check the various stages of his action and see whether he has obtained the desired results. This is the main function of written and oral tests. Evaluation is focused either on the students or on how far the action itself is conducive to the objectives pursued. For example, a teacher may have altered her teaching style to allow a greater degree of student freedom within the classroom. However, parents might complain that their children are not receiving regular homework assignments, other teachers might complain that their students are less obedient in class periods following the reformed class session, and perhaps the community might become annoyed at the drop in standardized test scores (as these tests were probably more consistent with the old teaching method), the students might complain that they no longer know what is expected of them, and finally, administrators who might not appreciate the new method might penalize or fire the teacher. All in all, the innovation was probably doomed from the start, not because it was a non-productive idea, but because it did not use a systems theory approach. Because of the lack of synergy, this new teaching style reform would probably be short lived and the learning of students might actually decrease. Systems analysis requires a mapping of elements and their interrelationships within the system. The mapping of elements can be accomplished by exploring the research related to the various factors that affect learning. There are many elements that influence the learning of children in school. Boccock (1980) identified these levels of factors and the following list is indicative but not exhaustive of the factors involved:

1. The attributes of the individual child, such as family background, race, culture, gender, intelligence, achievement, motivation, personality, and learning style;

2. The qualities of the classroom, such as teacher expectancies, peer group influence, classroom climate, style of teaching and theories of learning;

3. The factors of the school itself, such as teacher-teacher and teacher-principal relationships, studentteacher ratio, availability of special services personnel (e.g. nurse, counselor, special teachers, aides, speech therapists), the school climate and environment, and even the type and quality of facilities in the school;

4. The interface between the school and the community, such as the composition of the school board, the nature of parental and volunteer

involvement in the school, the involvement of businesses, the teacher union, and the degree of diversity within the community; and

5. The forces operating at the level of the state and national educational system, such as the effect of mass media on the popular image of what quality education means, national legislation affecting education, state and national policy regarding funding and requirements, and the types of learning resources distributed by the major publishing, software, and technology businesses. This example of levels of factors influencing learning makes clear that the educational system has increasing levels of complexity beginning with the individual learner and expanding to include national influences. Therefore, looking at the inter play of the factors and understanding that the educational enterprise works as a system seems most useful in developing effective change. Modifying the goals of the system is not easy, but it is also not impossible. In education, such change requires convincing all the major decision makers within the school system that the change in emphasis is desirable. Also, the change agent must persuade parents, students, and others in the local community that these changes will benefit themselves, as society needs to have graduates with certain qualities. Finally, the interventionist must convince the forces within the national educational system, such as the mass media, testing corporations, textbook publishers, government legislators, and funding sources, of the value of the change. The role of goals in a systems analysis is critical. The system uses its goals as a basis for assessing its performance. This process describes another aspect of systems. That is, a system seeks feedback on the quality of its functioning. For example, if society requires that high school graduates are competent in basic academic skills, then schools are going to place great emphasis on standardized achievement tests in these fields. Decisions regarding teaching methodology will be based on the degree to which the new method will produce students who score high on these tests. If, on the other hand, society indicates that schools to produce open minded, non-prejudiced graduates who desire to celebrate cultural differences, other types of attitudinal, behavioral, and cultural information tests will be created to assess these graduates, and schools will modify their teaching methods and curriculum to enhance the probability that their graduates will succeed on these measures. Thus, change will result by analyzing and altering the goals of education and then by bonding specific innovations and assessment instruments to these goals. Forums of national leaders have been called together to review goals. Various foundations and groups of professionals are hard at work creating their own set of stated goals. Curriculum/content groups have been working for years to reframe curriculum objectives based on their perceived goals. While many content groups are working on standards, there are really no overarching goals for the entire system. Nowadays there is a curriculum wars. Each of the many curriculum areas has their own goals, objectives, and learning approaches. In addition, they seem to be trying to establish the system's goals, or at least to have the system's goals include their agenda. That the objectives are growing and are not often interrelated and sometimes are in conflict causes problems. The content area experts have their agenda for educational goals. Various groups (e.g. single parents, education advocates, family value advocates, health issue groups, particular ethnic groups, religious groups, etc.) in society want to have influence as well. In addition, there are major conflicting views. Schools utilize all class time to teach cognitive learning and knowledge. Others believe schools should foster student's personal development, self-awareness and

confidence. Some see the school as the agency for helping the integration of all ethnic groups and to celebrate cultural differences. Finally, many see the goals of education, as preparing students to work and to be vocationally competent citizens in an emerging global market. Importance of System

Approach for Education

1. Framework for planning, decision making control and problem solving.
2. Throws light on dynamic nature of management.
3. Provides a unified focus to institutional efforts.
4. Helps to look at institution as a whole and not as parts.
5. Helps the manager to identify the critical sub systems and their interaction with each other.
6. Helps in improving institution.
7. Helps in bringing efficiency in school administration
8. Helps in systematic educational planning.
9. Maximum utilization of resources.
10. Helps in improving examination and evaluation system.
11. Maintaining, controlling and improving the guidance services.
12. Designing, controlling and improving non-formal and adult education system.
13. In improving quality of education.
14. In improving the teacher t raining programmes- in – service as well as pre – service. Views of socialization, goals of education, regulations, practices and activities within the community, school and classroom, outcomes assessments and personal/family values and beliefs interrelate in the total educational system. Unfortunately, the various elements of the system are not always consistent with each other. This dissipates the energy available to help children learn. Lining up the elements in a planned intervention, conceptualized from a systems perspective will increase the likelihood that the community will be focused on educating each child. If the elements are working together then, perhaps the Nigerian proverb that it takes a whole village to educate a child would be a reasonable hope.

5.3 Use of ICT in School Management

Change has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Rapid growth in the field of education has made governance in academic sector a very complex task. The 21st century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. Cost-effective technology combined with the flexibility in learning and administrative activities is essential to enhance efficiency.

Information and Communication Technology (ICT) plays a vital role in supporting powerful, efficient management and administration in education sector. It is specified that technology can be used right from student administration to various resource administration in an education institution.

S.No	Construct	Content categories
1.	Student Administration	Usage of electronic media by students to apply for admissions
2.	Student Administration	Usage of computers for student registration / enrolment
3.	Student Administration	Availability of time table / class schedule in electronic form
4.	Student Administration	Usage of computers for maintenance of attendance of students
5.	Student Administration	Communication of academic details of students to their parents / guardians through e-media
6.	Student Administration	Usage of e-media for notifications regarding hostel accommodation
7.	Student Administration	Usage of e-media for notifications regarding transportation
8.	Staff Administration	Usage of computers for recruitment and work allotment of staff in the institution
9.	Staff Administration	Automation of attendance and leave management of staff members in the institution
10	Staff Administration	Usage of electronic media for performance appraisal
11	Staff Administration	Communication with staff using e-media
12	Staff Administration	e-circulars from the institution regarding official matters
13	Staff Administration	e-kiosks are available in the institution
14	General Administration	Usage of e-media for scheduling / allocation of halls for examinations
15	General Administration	Dissemination of information in the institution through e-kiosks
16	General Administration	Usage of e-media by students to apply for university examinations
17	General Administration	Usage of e-media for the processing and display of results of students
18	General Administration	Facility for students to make fee payments electronically

Record Keeping

School records are books, documents, files and CD ROM in which is embodied information on what goes on in school (e.g. scholastic, co-scholastic, non-scholastic activities and important events etc), the school plant as well as other relevant information focusing on the growth and development of the school.

The school records are official transcripts or copies of proceedings of actions, events, other matters kept by the school administrator, school records could be viewed as authentic registers or instruments or documents of official

accounts of transaction or occurrence which are preserved in the school's office. Therefore, every school must keep certain specified records.

Importance of school records: School records keeping includes the fact that school records tell the history of the school and are useful historical sources.

Tell the history of the school and are useful historical sources.
Facilitate continuity in the administration and management of a school.
Facilitate and enhance the provision of effective guidance and counselling services for students in the social, academic career domains.
Provide information needed on ex-students by higher and other related institutions and employers of labour for admission or placement.
Facilitate the supply of information to parents and guardians for the effective monitoring of the progress of their children/wards in schooling or performance.
Provide data needed for planning and decision making by school heads, ministries of education and related educational authorities.
Provide a basis for the objective assessment of the state of teaching and learning in a school, including staff and student performance by supervisors and inspectors.
Provide information for the school community, the general public employers as well as educational and social science researchers for the advancement of knowledge.
Enable school heads to collate information on pupils and staff for decision making by higher authorities, the law courts security agencies and other related government agencies when occasion demands.
Provide a mechanism such as the school timetable for the productive management of time and coordination of school work and activities.
Serve as data bank on which both the school head and staff and even students can draw on.
Some Important School Records

• Admission and Withdrawal Register: This is a permanent record book into which is entered information regarding the entry and exit, including the details of the education and progress of each pupil that ever passes through the school.

• Attendance Register: An attendance register is a book in which the presence or absence of students in a school is recorded on a daily basis. It is a statutory record that must be kept by every school. This record is kept on individual class basis. The class teacher is the custodian of this record.

• Log Book: The log book is a historical record of events that have significant effects on the schools' activities.

• The Visitors Book: The book is meant for recording the visits of important personalities, including officials and from the ministries of education or other related government agencies or any other school related visitors.

• Staff and Students' Personal Files: It is necessary that the school should have as much information on every teacher and student as possible without violating their privacy.

• Cumulative Record Folder: Students' cumulative record folder is a storehouse of information on students' cognitive, affective and psycho-motor development.

• Students' Report Sheet/Card

1. It keeps data on students' academic performance in termly basis.
2. It assists in monitoring students' academic progress.
3. It is a compliment to cumulative record folders.

• Lesson Notes/Plan

1. It gives information on what a teacher plans to teach the students at a period of time.
2. It clearly shows the teachers' level of preparedness and their level of competence.
3. It challenges teachers for the task ahead.

• Scheme and Record of Work Book: It reflects estimate of academic work which teachers expect to accomplish in each subject based on number of lessons they will have during each term. Pertinently it shows the ability of the teacher to organize the year's work and his/her resourcefulness and enthusiasm regarding the progress of the pupils.

• Staff Time Book and Movement Book

1. They provide information on when staff report and or close at work.
2. They promote regular attendance and punctuality
3. They help checking truancy and gross indiscipline in staff.

• Transfer and Leaving Certificate: Transfer and leaving certificate is the formal exit of the student after completion of study or leaving during the course of study in a school.

• Library records: The library will have many records like stock register, issue register etc. Many of the routine function of the library can be automated using library management software.

• Stock register: it is the record of all equipments and materials available in the school including the laboratories

• Cash Register

1. It is a record of financial transactions in schools.
2. It gives information about income and expenditures.
3. It promotes accountability and prevents corrupt practices.

Potential of ICT in Record Keeping

The usefulness of keeping school records with Information and Communication Technologies (ICT) is for the following reasons:

• Administrative Efficiency: One major setback in achieving the educational objective of the secondary education is inefficiency of the principal in keeping some records. With the introduction of information and communication technologies such as computers, digital libraries, e-mail, internet and so on where information are stored and disseminated, principals can do better in keeping records, and become effective and efficient in performing their prescribed roles as administrators.

• Availability of Information: Information and Communication Technologies will help maintain adequate and accurate records in our schools and make it available with ease.

• Easy Retrieval: It also leads to easy accessibility and dissemination of information on school records, will become available for national planning, financial budgeting, effective implementation of the educational programs and policies.

School record keeping is all about information collection, storage, retrieval, use, transmission, manipulation and dissemination for the purpose of enriching communication, decision-making and problem solving ability in the school system. It is therefore necessary that this process be as accurate and accessible as possible. Using ICT in keeping school records will help to facilitate and enhance the administration of the school towards achieving the goals of the secondary education.

5.4 Rationale and Framework of ICT in Teacher Education

The UNESCO developed a a holistic framework to assist in designing the integration ofInformation and Communication Technologies (ICTs) into Teacher Education as given below (Fig. 5.1).

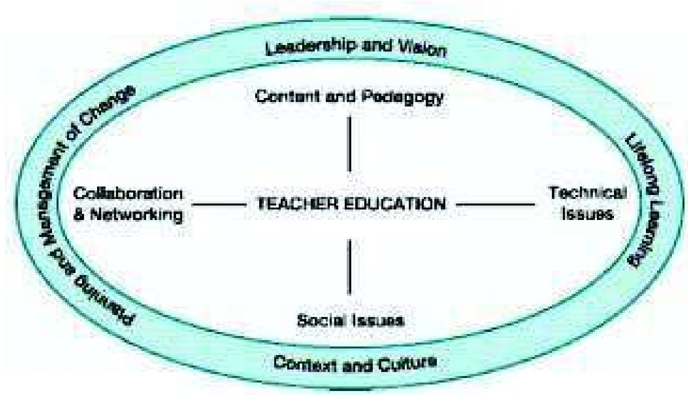


Fig 5.1 *UNESCO's Framework for ICTs in Teacher Education*

In the above given framework, the encompassing oval underscores that the framework should be interpreted as a whole. The curriculum framework is comprised of four clusters of competencies encircled by four supportive themes. The curriculum framework also suggests that each teacher is allowed to interpret the framework within hisor her context and personal approach to pedagogy, which is always related to the subject discipline or content area, rather than to the technology itself. The four themes that bind the curriculum as a whole are described briefly below, followed by descriptions of the four core competencies.

Four Themes

Context and Culture identifies the culture and other contextual factors that must be considered in infusing technology into teacher education curriculum. It includes the use of technology in culturally appropriate ways and the development of respect for multiple cultures and contexts, which need to be taught and modelled by teachers.

Leadership and Vision are essential for the successful planning and implementation of technology into teacher education and require both leadership and support from the administration of the teacher education institution. Lifelong Learning acknowledges that learning does not stop after school. In common with the other themes, it is important that teachers and teacher preparation faculty model lifelong learning as a key part of implementation, and as an ongoing commitment to ICTs in teacher education. Planning and Management of Change is the final theme, born of today's context and accelerated by technology itself. It signifies the importance of careful planning and effective management of the change process. These themes may be understood as a strategic combination of approaches that help teacher educators develop the four core competencies. The core competencies may be seen as clusters of objectives that are critical for successful use of ICTs as tools for learning.

Four Competencies

The ICT competencies are organized into four groups. Pedagogy is focused on teachers' instructional practices and knowledge of the curriculum and requires that they develop applications within their disciplines that make effective use of ICTs to support and extend teaching and learning. Collaboration and Networking acknowledges that the communicative potential of ICTs to extend learning beyond the classroom walls and the implications for teachers development of new knowledge and skills. Technology brings with it new rights and responsibilities, including equitable access to technology resources, care for individual health, and respect for intellectual property included within the Social Issues aspect of ICT competence.

Finally, Technical Issues is an aspect of the Lifelong Learning theme through which teachers update skills with hardware and software as new generations of technology emerge.

Keeping the holistic nature of this curriculum in mind, the model illustrates the interdependence of the themes and competencies – all themes interacting with all competencies. The following is a description of the four competencies.

Pedagogy

The most important aspect of infusing technology in the curriculum is pedagogy. When implementing the pedagogical competencies for infusing technology, the local context and the individual approach of the teacher linked with that of their subject discipline must be paramount. Teachers move through stages as they adopt ICTs. Initially, the teacher adopting technology applies it simply as a substitute for current teaching practice where technology is not used (e.g., teacher lecture becomes electronic presentation supporting lecture, students writing papers by hand become students writing papers using a word processor, course syllabus on paper becomes course syllabus online). The adaptation of ICTs by teachers should (and does) challenge and support changes in teaching practice, building upon individual pedagogic expertise. As teachers'

pedagogical practices with new technologies continue to develop, and organizational support and access to ICTs grow, it becomes possible to move beyond the adaptation of ICT applications that fit with existing practice. Transformation of the educational process will start to emerge and may move toward more student-centred learning environments. In summary, as professional teachers educators continually develop their pedagogical use of ICTs to support learning, teaching, and curriculum development, including assessment of learners and the evaluation of teaching, they will:

- demonstrate understanding of the opportunities and implications of the uses of ICTs for learning and teaching in the curriculum context;
- plan, implement, and manage learning and teaching in open and flexible learning environments;
- assess and evaluate learning and teaching in open and flexible learning environments.

Collaboration and Networking

ICTs provide powerful new tools to support communication between learning groups and beyond classrooms. The teacher's role expands to that of a facilitator of collaboration and networking with local and global communities. The expansion of the learning community beyond the classroom also requires respect for diversity, including inter-cultural education, and equitable access to electronic learning resources. There is growing evidence that communities learn through collaborative activities that reflect diverse cultures in authentic projects that serve society. Both local and global understandings can be enhanced using ICTs. The development of teachers' competencies in networking and collaboration are therefore essential to ICTs in education. Through collaboration and networking, professional teachers promote democratic learning within the classroom and draw upon expertise both locally and globally. In this process, they will:

- demonstrate a critical understanding of the added value of learning networks and collaboration within and between communities and countries;
- participate effectively in open and flexible learning environments as a learner and as a teacher;
- create or develop learning networks that bring added value to the education profession and society (locally and globally);and
- widen access and provide learning opportunities to all diverse members of the community, including those with special needs.
- Social and Health Issues

- The power to access information and communication technologies brings increased responsibilities for everyone. Legal and moral codes need to be extended to respect the intellectual property of freely accessible information. Copyright applies to web resources, too, regardless of the ability of the user to purchase the rights. This respect can be modelled in classroom practice with students from an early stage. The challenges faced by society, locally and globally, by adoption of technology should become part of the curriculum in a way that involves learners and helps them to develop an

effective voice in the debates. Health issues of ICTs also need to be addressed. For example, prolonged engagement with ICTs (including screens and keyboards) requires appropriate support for the body, especially the hands and back. Similarly, hazards of electricity and other power sources require care and the modeling of safe practice. The technology standards for students and teachers from the International Society for Technology in Education (ISTE) offer guidelines for social issues, under the topic of social, ethical, legal, and human guidelines relating to the responsible use of technology. In summary, professional teachers need to understand social and health issues surrounding ICTs and apply that understanding in their practice. Specifically, they need to:

- understand and apply the legal and moral codes of practice, including copyright and respect for intellectual property;
- reflect upon and lead discussion of the impact of new technology on society, locally and globally; and
- plan and promote healthy use of ICTs, including seating, light, sound, and related energy sources (including electricity and radio signals).
- Technical Issues
- Technical issues regarding integration of ICTs into the curriculum include the technical competencies and provision of both technical infrastructure and technical support for technology use throughout the curriculum. Technical competencies of the individual are perhaps the most obvious but perhaps the least important in the long-term because use of technology should ultimately become transparent. When technology is robust and used competently, it moves from the foreground to the background and remains essential. This is similar to the process of gaining any new skill set, such as riding a bicycle. Each new skill must be consciously attended to and practiced until it becomes an automatic response. Competent bike riders do not focus on balance and the pedals of the bike, they focus on navigation and safety. However, we do recognize that in many contexts, the lack of technology competence, infrastructure, and technical support can create barriers to access and reliability resulting in diminished support for the curriculum. Additional technical support or training is therefore advised, depending on local circumstances. Simply providing the technology for learners and teachers is not enough. The type and level of access is also important. ICTs will improve learning very little if teachers and students have only rare and occasional access to the tools for learning. Reasonable access to ICTs has been shown to be important for the acquisition of competence with hardware and software, especially for teachers. For example, provision of portable computers is an important strategy for ICTs teacher education. Teachers with portable computers can use them for both teaching in school and for other professional activities elsewhere.
- In summary, professional teachers, provided with reliable technology infrastructure and technical assistance, demonstrate continual growth in their skill with ICTs and knowledge of their

current and emerging applications within education and local and global society. Specifically they are able to:

- use and select from a range of ICT resources to enhance personal and professional effectiveness; and
- willingly update skills and knowledge in the light of new developments.

ICT Skills as Needs of the Digital Age Teachers

- Today's teachers in order to be truly the teachers of the digital era have to assume new roles as detailed below:

- Facilitators helping learners to make judgments about the quality and validity of new source and knowledge;
- Open-minded and critical independent professionals;
- Active cooperators and collaborators; and
- Mediators between learners and what they need to know.
- For teachers to be able to integrate the use of ICTs in teaching various skills, they need to be trained in vast array of competence such as:
- Operating computers and using basic software for word processing, spreadsheets, e-mail, etc;
- Evaluation and using computers and related ICT tools for instruction;
    - Appling current instructional principles, research, and appropriate assessment practices to the use of ICTs;
    - Evaluating educational software;
    - Creating effective computer based presentations;
    - Searching the internet for resources;
    - Integrating the ICT tools into student learning activities across the curriculum;
    - Creating multimedia documents to support instruction;
    - Creating hypertext documents to support instruction;
    - Demonstrating knowledge of ethics and equity issues related to technology; and
    - Keeping up-to-date far as educational technology is concerned.

Rationale

It is needed to develop a very detailed rationale before beginning to use computers in schools and classrooms. There is no meaning in providing computers in schools unless such a rationale has been done. With the increasing availability of computer hardware, it is very crucial that teachers do not become involved in the machine but focus rather on their main role as teachers. Teachers need to widen their imaginations with the awareness that as developments in computer technology occur they will be able to achieve more of their objectives in teaching the students.

Collis (1989) had described that these view of students sitting behind computer for much of the day have largely not occurred in mainstream schools, and most would not like this to be realised. Since the 1960's the computer has been established they had seen the computers as the solution

to many problems in education. With this, many early computer scientists saw the possibility of the computer replacing teachers in schools.

There are three main rationales for ICT in schools, one concerns the organisational productivity of the school, and the other two focus on the needs of students which are technological literacy and support for their learning. The two rationales are assisted by the Australian report Raising the Standards (DEST, 2002, p. 38)

The need for ICT competent teachers stems from the need for ICT competent students and for ICT-rich learning environments that enhance students' learning across the curriculum.

Becker et al (1999) have said that despite from in a few excellent schools, computers had only a minimum effect on what happens in classrooms in the 20th century. There has been much argue over the purposes for this difference between the potential and what is realised. The computer is one of a type of technologies now available to teachers and students. In these cases a large amount of money was spent on these resources which some would argue would have been better spent on other resources. It is important that rare resources to support learning in schools are not wasted and therefore care needs to be taken in choosing to use computers to support learning. Historically, technology has been developed to answer problems, develop living standards. Therefore, it is reasonable that we should expect educational technology to be developed with similar objectives that is to increase the productivity and solve problems in teaching and learning syllabus.

5.5 ICT Competencies in Teachers Instructional Design.

The development of teachers' competencies in networking and collaboration are therefore essential to ICTs in education. Through collaboration and networking, professional teachers promote democratic learning within the classroom and draw upon expertise both locally and globally. In this process, they will:

- demonstrate a critical understanding of the added value of learning networks and collaboration within and between communities and countries;
- participate effectively in open and flexible learning environments as a learner and as a teacher;
- create or develop learning networks that bring added value to the education profession and society (locally and globally);and
- widen access and provide learning opportunities to all diverse members of the community, including those with special needs.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. Define Approach for Education

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2.Define Potential of ICT in Record Keeping.

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5.6 LET US SUM UP

In this unit you have learnt the concept of ICT in Learning Process

5.7 UNIT- END- EXERCISES

1.What are the Use of ICT in School Management

5.8 ANSWER TO CHECK YOUR PROGRESS

Change has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Rapid growth in the field of education has made governance in academic sector a very complex task. The 21st century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. Cost-effective technology combined with the flexibility in learning and administrative activities is essential to enhance efficiency.

5.9 SUGGESTED READINGS

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UNIT VI PROGRAMMED INSTRUCTION

Structure

6.1 Introduction

Programmed Instruction is a sub-head under instruction and represents a more rigorous attempt to develop a mastery over specified goals to secure "insured" learning. Programmed Instruction involves controlled, carefully specified and skillfully arranged learning experiences. They are self-instructional and self-corrective. The fundamental idea of programmed self-instructional materials was described in 1912 by Edward L. Thorndike in these words: "If by a miracle of mechanical ingenuity, a book could be so arranged that only to him who had done what was directed on page one, would page two become visible and so on, much that now requires personal instruction could be managed by print." Programmed instruction is a technique of self-instruction in which all of the instructional load is carried by teaching machines or programmed texts. Programmed Instruction is a new path towards automation and individualized instruction

6.2 Basic concepts of Programmed Learning / Instruction

Smith and Moore (1962), "Programmed instruction is the process of arranging the material to be learned into a series of sequential steps, usually it moves the student from a familiar background into a complex and new set of concepts, principles and understanding."

Skinner (1954), "A Programmed Learning is the first application of laboratory technique utilized in the study of the learning process to the practical problems of education."

Gulati and Gulati (1976), "Programmed learning as popularly understood is a method of giving individualized instruction, in which the student is active and proceeds at his own pace and is provided with immediate knowledge of results. The teacher is not physically present. The programmer, while developing programmed material has to follow the laws of behavior and validate his strategy in terms of student learning."

6.2.1 Principles of Programmed Learning

A good programmed learning material incorporates good principles of learning. The basic idea of programmed learning is that most efficient, pleasant and permanent learning must take place. The following are the principles on which programmed learning is based.

a) Principles of Small Steps: A programme is made up of a large number of small, easy to take steps. A student can proceed from knowing very little about a topic to mastery of the subject by going through aprogramme.
b) Principle of Active Responding: This principle rests on the assumption that a learner learns better by being active. Programming provides opportunity for learner to respond frequently. It not only presents materials to the learner but also induces sustained activity.
c) Principles of Immediate Confirmation: The psychological phenomenon of reinforcement is the basis of this principle. Necessary of providing immediate confirmation is important from two points of view – i) the learner will not wildly guess; ii) when the learner is not sure of the response he/she needs to be confirmed of the correctness of the response or provided with the right response.
d) Principle of Self-pacing: Programmed learning is a technique of individualized learning. It is based on another basic assumption that learning can take place better if an individual is allowed to learn at his own pace. The pupil is not forced to move with other members of the class. Some students naturally learn more rapidly or more slowly than others. In a normal classroom some students may be left behind as they are not able to keep pace with the teacher but here the learner is able to learn at his own pace. This principle controls individual difference in the process of learning.
e) Principle of Student Testing: Continuous evaluation of the learning process helps in maximising learning is another assumption on which programmed learning is based. The student leaves behind a record of his responses because he is required to write a response for each frame on a response sheet. This detailed record helps in revising the programme and also provides a feedback to the teacher about the students'progress.

6.3 Origin and Types of Programming

Origin

Computer programming is essential in our world today, running the systems for almost every device we use. Computer programming languages allow us to tell machines what to do. Machines and humans “think” very differently, so programming languages are necessary to bridge that gap.

The first computer programming language was created in 1883, when a woman named Ada Lovelace worked with Charles Babbage on his very early mechanical computer, the Analytical Engine. While Babbage was concerned with simply computing numbers, Lovelace saw that the numbers the computer worked with could represent something other than just amounts of things. She wrote an algorithm for the Analytical Engine that was the first of its kind. Because of her contribution, Lovelace is credited with creating the first computer programming language.

1883: Algorithm for the Analytical Engine: Created by Ada Lovelace for Charles Babbage’s Analytical Engine to compute Bernoulli numbers, it’s considered to be the first computer programming language.

1949: Assembly Language: First widely used in the Electronic Delay Storage Automatic Calculator, assembly language is a type of low-level computer programming language that simplifies the language of machine code, the specific instructions needed to tell the computer what to do.

1952: Autocode: Autocode was a generic term for a family of early computer programming languages. The first was developed by Alick Glennie for the Mark 1 computer at the University of Manchester in the U.K. Some consider autocode to be the first compiled computer programming language, meaning that it can be translated directly into machine code using a program called a compiler.

1957: Fortran: A computer programming language created by John Backus for complicated scientific, mathematical, and statistical work, Fortran stands for Formula Translation. It is the one of the oldest computer programming languages still used today.

1958: Algol: Created by a committee for scientific use, Algol stands for Algorithmic Language. Algol served as a starting point in the development of languages such as Pascal, C, C++, and Java.

1959: COBOL: Created by Dr. Grace Murray Hopper as a computer programming language that could run on all brands and types of computers, COBOL stands for COmmon Business Oriented Language. It is used in ATMs, credit card processing, telephone systems, hospital and government computers, automotive systems, and traffic signals. In the movie The Terminator, pieces of COBOL source code were used in the Terminator’s vision display.

1959: LISP: Created by John McCarthy of MIT, LISP is still in use. It stands for LISt Processing language. It was originally created for artificial intelligence research but today can be used in situations where Ruby or Python are used.

1964: BASIC: Developed by John G. Kemeny and Thomas E. Kurtz at Dartmouth College so that students who did not have a strong technical or mathematical understanding could still use computers, it stands for Beginner's All-purpose Symbolic Instruction Code. A modified version of BASIC was written by Bill Gates and Paul Allen. This was to become the first Microsoft product.

1970: Pascal: Developed by Niklaus Wirth, Pascal was named in honor of the French mathematician, physicist, and philosopher Blaise Pascal. It is easy to learn and was originally created as a tool for teaching computer programming. Pascal was the main language used for software development in Apple's early years.

1972: Smalltalk: Developed by Alan Kay, Adele Goldberg, and Dan Ingalls at Xerox Palo Alto Research Center, Smalltalk allowed computer programmers to modify code on the fly and also introduced other aspects now present in common computer programming languages including Python, Java, and Ruby.

1972: C: Developed by Dennis Ritchie at Bell Labs, C is considered by many to be the first high-level language. A high-level computer programming language is closer to human language and more removed from the machine code. C was created so that an operating system called Unix could be used on many different types of computers. It has influenced many other languages, including Ruby, C#, Go, Java, JavaScript, Perl, PHP, and Python.

1972: SQL: SQL was developed by Donald D. Chamberlin and Raymond F. Boyce at IBM. SQL stands for Structured Query Language. It is used for viewing and changing information that is stored in databases. SQL uses command sentences called queries to add, remove, or view data.

1978: MATLAB: Developed by Cleve Moler. MATLAB stands for Matrix Laboratory. It is one of the best computer programming languages for writing mathematical programs and is mainly used in mathematics, research, and education. It can also be used to create two- and three-dimensional graphics.

1983: Objective-C: Created by Brad Cox and Tom Love, Objective-C is the main computer programming language used when writing software for macOS and iOS, Apple's operating systems.

1983: C++: C++ is an extension of the C language and was developed by Bjarne Stroustrup. It is one of the most widely used languages in the world. C++ is used in game engines and high-performance software like Adobe Photoshop. Most packaged software is still written in C++.

1987: Perl: Perl was originally developed by Larry Wall in 1987 as a scripting language designed for text editing. Its purpose was to make report processing easier. It is now widely used for many purposes, including Linux system administration, Web development, and network programming.

1990: Haskell: Named after Haskell Brooks Curry, an American logician and mathematician. Haskell is called a purely functional computer programming language, which basically means that it is mostly mathematical. It is used by many industries, especially those that deal with complicated calculations, records, and number-crunching.

1991: Python: Designed by Guido Van Rossum, Python is easier to read and requires fewer lines of code than many other computer programming languages. It was named after the British comedy group Monty Python. Popular sites like Instagram use frameworks that are written in Python.

1991: Visual Basic: Developed by Microsoft, Visual Basic allows programmers to choose and change pre-selected chunks of code in a drag-and-drop fashion through a graphical user interface (GUI).

1993: R: Developed by Ross Ihaka and Robert Gentleman at the University of Auckland, New Zealand, R is named after the first names of the first two authors. It is mostly used by statisticians and those performing different types of data analysis.

1995: Java: Originally called Oak, Java was developed by Sun Microsystems. It was intended for cable boxes and hand-held devices but was later enhanced so it could be used to deliver information on the World Wide Web. Java is everywhere, from computers to smartphones to parking meters. Three billion devices run Java!

1995: PHP: Created by Rasmus Lerdorf, PHP is used mostly for Web development and is usually run on Web servers. It originally stood for Personal Home Page, as it was used by Lerdorf to manage his own online information. PHP is now widely used to build websites and blogs. WordPress, a popular website creation tool, is written using PHP.

1995: Ruby: Ruby was created by Yukihiro “Matz” Matsumoto, who combined parts of his favorite languages to form a new general-purpose computer programming language that can perform many programming tasks. It is popular in Web application development. Ruby code executes more slowly, but it allows for computer programmers to quickly put together and run a program.

1995: JavaScript: Created in just 10 days by Brendan Eich, this language is mostly used to enhance many Web browser interactions. Almost every major website uses Javascript.

2000: C#: Developed by Microsoft with the goal of combining the computing ability of C++ with the simplicity of Visual Basic, C# is based on C++ and is similar to Java in many aspects. It is used in almost all Microsoft products and is primarily used for developing desktop applications.

2003: Scala: Created by Martin Odersky. Scala is a computer programming language that combines functional programming, which is mathematical, with object-oriented programming, which is organized around data that controls access to code. Its compatibility with Java makes it helpful in Android development.

2003: Groovy: Developed by James Strachan and Bob McWhirter, Groovy is derived from Java and improves the productivity of developers because it is easy to learn and concise.

2009: Go: Go was developed by Google to address problems that can occur in large software systems. Since computer and technology use is much different today than it was when languages such as C++, Java, and Python were introduced and put to use, problems arose when huge computer systems became common. Go was intended to improve the working environment for programmers so they could write, read, and maintain large software systems more efficiently.

2014: Swift: Developed by Apple as a replacement for C, C++, and Objective-C, Swift is supposed to be easier to use and allows less room for mistakes. It is versatile and can be used for desktop and mobile apps and cloud services.

Types of Programming

In programmed learning, the presentation of the instructional material or subject matter to the learner in a suitable form is termed as programming. The three styles of programming are the following

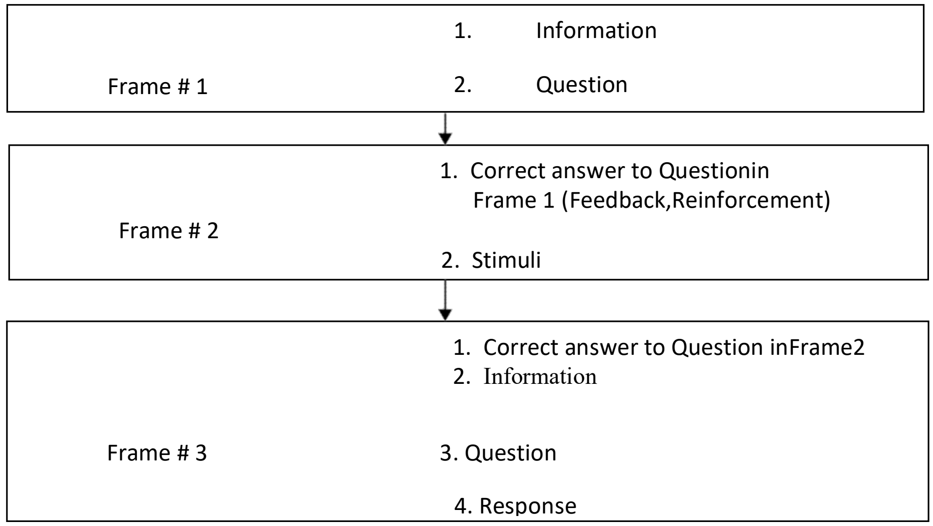
- Linear Programming,
- Branching Programming and
- Mathetics.

6.3.1 Linear or Extrinsic Programming:

Skinner and his associates are the originators of the linear type of programme. This type of programming is directly related with his theory of operant conditioning and is based on the assumption that human behavior can be shaped or conditioned gradually, step by step with suitable reinforcement for each desired response. Here questions are asked directly and the leaner is required to think and write down his answer – thus the answers are referred to as ‘constructed responses’. In this type of programme, every learner starts from the initial frame and ends at the terminal frame following the same sequence. Every student must go through each and every frame in a straight line fashion. Hence, it called a linear

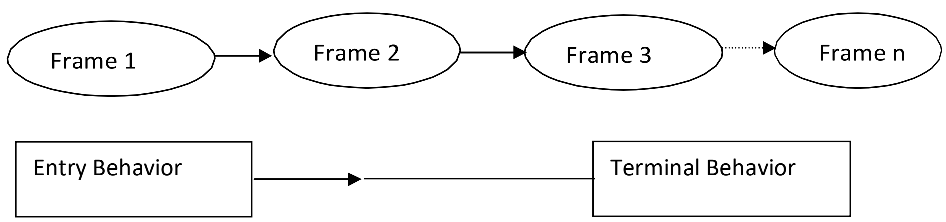
programme. But each student has the liberty to complete the programme at his own andability.

f) Structure of Linear Programme



g) Subject matter is broken down into very small steps and each step is presented in proper sequence. The active responses of the learner are immediately reinforced in the succeeding frame. In some frames cues or prompts are provided to aid in getting correct response and to diminish errors.

h) Pictorial Representation of Linear Frame



6.4 Branching Programming

Branching Programme was developed by Norman. A. Crowder, hence it is also known as Crowderian Model. Crowder defines this style of programming as: "It is a programme which adapts to the needs of the students without the medium of extrinsic device as a Computer. It is called intrinsic because the learner within himself makes the decision, to adapt the instructions to his/her needs." In comparison to linear programming the frame size and amount of information give is more and is followed by multiple choice type of question. Out of the choices, only one answer is correct. If the learner chooses the correct answer, he is informed of the correctness of the answer and is motivated to proceed to the next frame along the main path of learning of the programme. If the answer is wrong the leaner is told why he/she is wrong and he /she either returns to the main

line or he/she is routed back to the original frame to read along a remedial frame till he chooses the right answer.

6.4.1Features of Branching Programme

- The instructional material is divided into frames. In each frame, information running into one/Two, paragraphs or even a page is provided.
- After going through the frame, the learner has to respond to a multiple-choice question. He has to discriminate among the choices provided and choose a correct response.
- The learner moves forward if he answers correctly but is diverted (branched) to remedial frames if he chooses the wrong answer.
- This cycle goes on till the learner passes through the entire material at his own pace.
- Branching programme can be produced in a teaching machine or in a book form. The book will be in the form of a scrambled text as the matter does not follow a normal sequence.

Structure of Branching Programme

Page 1

Information

Question

(a) See page 1(a)
(b) See page2

Page 2

From Page 1

Yes, your answer is correct. Very Good.
Read the following Information.

(a) ……… See page….
(b) ………See page….
(c) ………See page…..

Page 2

From Page 1

Yes, your answer is correct. Very Good.
Read the following Information.

(d) ……… See page….
(e) ………See page….
(f) ………See page…..

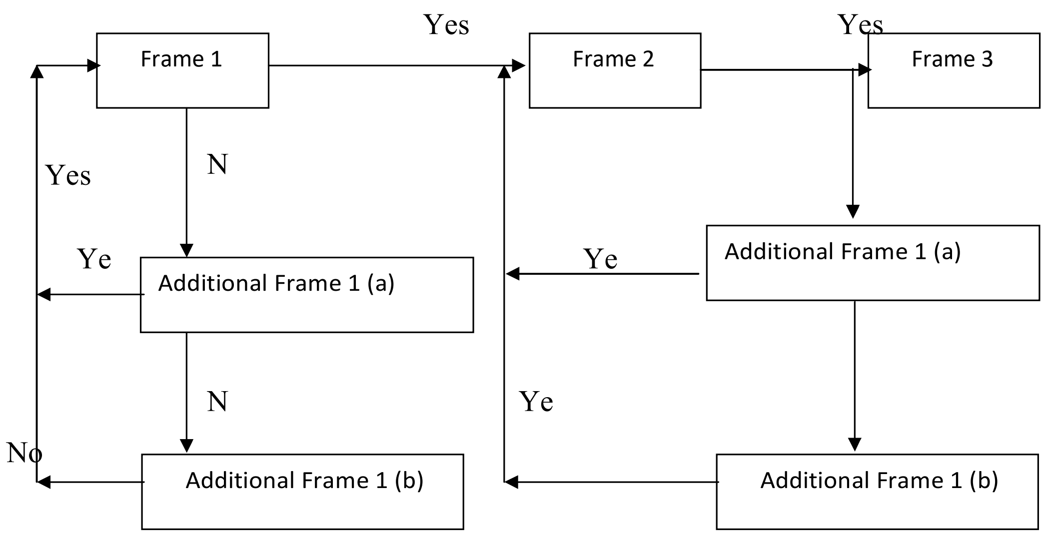
Page 2

From Page 1

Yes, your answer is correct. Very Good.
Read the following Information.

(g) ……… See page….
(h) ………See page….
(i) ………See page…..

Pictorial Representation of Branching Programme



6.4.2Mathetics Programming

Mathetics type of programming was formulated by Thomas. F. Gilbert and the term is derived from the Greek word "Mathein" means "to learn". A mathetics programme begins with an instructional plan and an analysis of what is to be taught. One of the basic concepts of mathetics is to start with the most motivating task and generally it is the last or final step in any task. Hence, the learner starts from the last task and goes backward to finally reach the introductory part.

Modes of Presentation

In the field of instructions, a computer plays a major role. In these computer assisted instructions, is interacts directly with the learners while presenting lessons. The computer delivers instructions directly to students and permits them to interact with the computer through the lessons programmed in the system. There are various instructional modes which can be facilitating by programmed instructions.

1. Tutorial Mode: In tutorial, information is presented in small units followed by a question. The pupils' response is analysed by the computer and appropriate feedback is given. A network of branches or pathways can be programmed to teach. The pupils are allowed to work on their own pace. The more alternative programmes available to the computers, the more adaptive the tutorial can be to individual differences.
2. Drill or Practice: In this mode, the programme leads the learner through a series of examples to develop dexterity and

fluency in using the skill. All correct responses are reinforced. Only on achieving the mastery by the learner, the computer will proceed further.

3. Discovery Mode: Here, inductive approach is followed. The problems are presented and the pupil solves those problems through trial and error. It is just like laboratory learning. It aims at the deeper understanding of the results obtained from discovery. Hence, complex problems can be solved.
4. Gaming Mode: This mode may or may not be instructional, but it is recreational. Sometimes learning takes place through games. This mode is especially meant for young children.
5. Simulation Mode: Here the pupil faces scaled down approximation of real life situations. Hence, realistic practice takes place without involving any risk.
6. Problem Solving Mode: Problem solving can be readily achieved provided the typical computational capability of the computer is available and there is a typewriter and display response device with remote control of two-way communication. The students need to know how to communicate with computer and how to solve his problem.

6.5 Development of the Programmed Instruction Material

The following steps is too involved in developing programmed learning and implementing programmed learning instruction in the classroom.

- Topic Selection: The programmes should select the most familiar topic; otherwise he has to take the help of a subject expert.
- Content Outline: After topic selection, its outline may be prepared which cover all the materials, one plans, to teach. For this programme one has to refer to examine relevant books and materials.
- Instructional Objectives: Instructional Objectives must be formulated which involve both task description and task analysis. The former is the description of terminal behaviors which the learner is expected to achieve and the latter is the series of component behaviors that he is required to acquire in the process of achieving terminal behavior.
- Entry Skill: The learner should have some pre-requisite ability and skill to understand properly the new programme. This background experience is called the entry skill and a suitable programme cannot ne prepared without proper assessment of the entry skill.

- Presentation of the Material: Suitable format is to be decided for presenting the material from the educational point of view. Then the programmed material should be presented in a sequence of frames arranged as steps towards terminal behavior.
- Student Participation: On analysis of the terminal behavior one will find the critical responses of the students.
- Terminal Behavior Test: The effect of programme can be ascertained by administering the terminal behavior test. It is also known as performance assessment. This provides feedback to the programme and shows the effectiveness of the instructional materials.
- Revision: Lastly the programme may be revised on the basis of feedback. The instructional materials may be edited and modified according to the needs and requirements of the target audience.

Programmed Learning is a self-instructional device. A rapid learner can cover the material quickly and slow learner may proceed on his own pace. It helps the learner to teach himself at any place and pace according to his convenience. The analytical thinking and self- direction of learners are also promoted through the use of programmed learning materials.

Advantages of Programmed Instruction

The Student is continually active when he/she is using a programme, in other methods of teaching he is active only sometimes and practically nil in a lecture

1. Programmed instructions are individual instruction. Every student proceeds at his/her own pace. In a conventional class, the teacher attends to only children of average abilities with the consequence that the intelligent get bored and the dull have no extra help. But programme instruction helps the dull with information where it is needed and no stigma is attached to the making of mistakes. At the same time, it does not hold up the progress of a fast learner as he goes along and completes the task at his own pace of learning.
2. Immediate reinforcement helps a child to know whether his answer is right or wrong. In normal class feedback takes a longtime.
3. A programme is planned and prepared much more carefully than a teacher would do for a conventional teaching programme.
4. Each programme has to prove itself it to be effective during the process of validation and must be rewritten as many times as is necessary.
5. A programme is not a human being and hence can be used at any time of the day. Programmed materials or teaching machines are never tired and never lose their temper or patience. Hence programmed materials are very useful in the field of non-formal education.

Limitations of Programmed Instruction

1. Programmed learning does not eliminate competition or grades as often claimed.
2. Later reinforcements often do not accelerate learning.
3. Programmed instruction restricted the learner's freedom of choice resulting in cramping of his imagination and initiative.
4. Operant conditioning is found successful only with some pupils, in some cases and not in all. Programmed instruction ignores or makes inadequate provisions for variables like cognitive variables personality variables and motivational variables.
5. The teacher – pupil contract which is so vital for development of human personality and relationship is completely lost.
6. In language learning, speech is equally important as development of reading and comprehension skills. But there is no scope for proving this experience.

Development of the Programmed Instruction Material

Programmed Instructional material forms an important part of the study. The achievement of the objectives to a great extent depends upon the appropriate instructional materials. The development of materials should be tailored to particular student vocabularies, types of experiences, learning patterns and specific objectives. It is, therefore, very important that care should be taken to develop instructional materials according to the pre-decided objectives of each component. The details of the development of instructional, materials for four components included in the present study have been described here. In addition to these, this chapter also presents the details regarding the development of other instruments used in this study. As mentioned in chapter III, in the present investigation, out of the four components, the PIM has been included as the major component of the strategy. Therefore, the procedure of the development of software material for the PIM has been given first, with all the necessary details. After giving the complete procedure upto the individual and group tryout, the procedure about the development of the software material for other three components, viz., library-reading, discussion and practical work followed by procedure of field try-out have been described. According to the order mentioned, the procedure followed to develop the software material for all the components is as under : ' - Development of programmed learning material - Library - Reading (References) - Discussion (Points for discussion) - Practical work assignment - Field tryout - Instruments to measure students' characteristics 4.1 Development of Programmed learning Material Programmed learning material was developed for the course content. Phe development of P1M falls under the following phases.

1. Preparation :

(a) Analysis of the course content

(b) Behavior specifications –

(i) Terminal behaviors

(ii) Entering behaviors and target population

(iii) Criterion test

(c) Task Analysis

(d) Programmed style, presentation format, response mode.

2. Writing the programme :

(a) Writing the frames

(h) Types of frames

(i) Teaching frames

(ii) Practice frames

(iii) Review frames

(iv) Criterion frames

(c) Prompts

(d) First draft of the programme

3. Field Testing :

4. Revision and final draft

4.1.1 Preparation :

4.1.1.1 (a) Analysis of the Course Content : First of all the course contents were analysed in detail. The course on 'Educational Evaluation' includes six 'units. It is prescribed as a compulsory p course for the B.Ed. students of S.I.D.T. Women's University. The special feature of the course is that, the student teachers have to utilize the knowledge of evaluation in their day-to-day practice-teaching work throughout the year. So units were rearranged according to the importance of utility to provide theoretical and practical knowledge at the right time. Another consideration for the rearrangement of the units was regarding the development of PLM, which requires some sequential order of units. Proper sequence for the presentation of contents was decided on the basis of flow charts. Plow charts Wei's prepared to study the interdependency of the different concepts to be covered and for the proper sequencing of content material. The course content includes the following six units : 1. The concept and theory of evaluation 2. Taxonomy of educational objectives 3. Techniques of evaluation 4. Types of questions 5. Acquaintance with tools of evaluation 6. Unit test Plow chart I presents a comprehensive picture of the content of complete course. Plow Chart II presents the analysis of the content included in Unit I. In the same manner flow charts from III to 1/ present the analysis of the content included in the Units III to II. All the flow charts are presented here. 4.1.1.2 (b) Behavior Specifications: (i) Terminal behaviors: The first step in designing an instructional system is the specification of the purpose and objectives to be achieved. In an instructional system the ’end-product* is the behavior of student. In contrast to the broad educational goals, 'terminal behavior* is defined by Glaser (1969) as the performance that the student should display at the end of specific instructional situations', terminal behavior is nothing but a description of behaviors which students must acquire during the process of instruction. Effectiveness of instructional work depends on how well the students acquire the terminal behaviors. Considering the proficiency the B.Ed. students should acquire through the course, for carrying out evaluation work in schools and in consideration to the different content areas included in the course, terminal objectives were specified

in behavioral terms for all six units. The list of terminal behaviors for all six units have been presented here.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the Modes of Presentation

…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………

2. Define Programmed Learning.

…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………

6.6 LET US SUM UP

In this unit you have learnt the concept of Programmed Instruction

6.7 UNIT- END- EXERCISES

1.What are the Advantages of Programmed Instruction

6.8 ANSWER TO CHECK YOUR PROGRESS

1. Programmed instructions are individual instruction. Every student proceeds at his/her own pace. In a conventional class, the teacher attends to only children of average abilities with the consequence that the intelligent get bored and the dull have no extra help. But programme instruction helps the dull with information where it is needed and no stigma is attached to the making of mistakes. At the same time, it does not hold up the progress of a fast learner as he goes along and completes the task at his own pace of learning.
2. Immediate reinforcement helps a child to know whether his answer is right or wrong. In normal class feedback takes a longtime.
3. A programme is planned and prepared much more carefully than a teacher would do for a conventional teaching programme.
4. Each programme has to prove itself it to be effective during the process of validation and must be rewritten as many times as is necessary.
5. A programme is not a human being and hence can be used at any time of the day. Programmed materials or teaching machines are never tired and never lose their temper or patience. Hence programmed materials are very useful in the field of non-formal education.

6.9 SUGGESTED READINGS

1. Adam, D.M.(1985). Computers and Teacher Training; A Practical Guide. New York: The Haworth Press Inc.
2. Behera, S.C.(1991). Educational Television Programmes. New Delhi: Deep and Deep Publications.
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UNIT VII TEACHING TECHNOLOGY

Structure

7.1 Introduction

Student-centered learning also known as learner-centered learning is an approach that places students interest first. The students can determine what needs to be learned and the tools that will be used in their learning environment. The adult learners have the option to work in teams to discuss the assigned problems and projects. This approach has evolved over the years compare to the traditional teacher-centered approach in kids and adults learning. The students-centered learning is currently implemented by several technical colleges and universities not only in science and technology streams but also in arts and social sciences (Noora, 2012). In the following section two different teaching methods and practices (Andragogy and Pedagogy) will be addressed and highlighted focusing on the definitions, assumptions, and important key points. In addition to that, the relationship between the two theories (Andragogy and Pedagogy) and student motivation will also be presented in third sections. Consequently, the implications of the theories (Andragogy and Pedagogy) on classroom practice and student learning specifically in Bahrain Polytechnic will be emphasized. Finally, conclusions will be drawn and recommendations will be presented based on the above theories. We will share our personal classroom experience teaching adult learners in Bahrain Polytechnic.

7.2 Concepts of Andragogy

Two primary understandings of "andragogy" exist:

The science of understanding (theory) and supporting (practice) lifelong education of adults.
In the tradition of Malcolm Knowles, a specific theoretical and practical approach. It is based on a humanistic conception of self-directed and autonomous learners as well as teachers as facilitators of learning.
Interpreted broadly throughout academic literature, the term also invites other definitions such as "adult education practice", "desirable values", "specific

teaching methods", "reflections", and "academic discipline", with many authors claiming it to be better than traditional adult education.

The term has been used by some to allow discussion of contrast between self-directed and self-taught education.

Andragogy, also known as adult learning theory, was proposed by Malcom Shepard Knowles in 1968.[i] Previously, much research and attention had been given to the concept of pedagogy – teaching children. Knowles recognized that there are many differences in the ways that adults learn as opposed to children. His thoughts surrounding andragogy sought to capitalize on the unique learning styles and strengths of adult learners.

7.2.1 Knowles' Five Assumptions of Adult Learners

Knowles theory of andragogy identified five assumptions that teachers should make about adult learners.

Self-Concept – Because adults are at a mature developmental stage, they have a more secure self-concept than children. This allows them to take part in directing their own learning.

Past Learning Experience – Adults have a vast array of experiences to draw on as they learn, as opposed to children who are in the process of gaining new experiences.

Readiness to Learn – Many adults have reached a point in which they see the value of education and are ready to be serious about and focused on learning.

Practical Reasons to Learn – Adults are looking for practical, problem-centered approaches to learning. Many adults return to continuing education for specific practical reasons, such as entering a new field.

Driven by Internal Motivation – While many children are driven by external motivators – such as punishment if they get bad grades or rewards if they get good grades – adults are more internally motivated.

7.2.2 Four Principles of Andragogy

Based on these assumptions about adult learners, Knowles discussed four principles that educators should consider when teaching adults.

Since adults are self-directed, they should have a say in the content and process of their learning.

Because adults have so much experience to draw from, their learning should focus on adding to what they have already learned in the past.

Since adults are looking for practical learning, content should focus on issues related to their work or personal life.

Additionally, learning should be centered on solving problems instead of memorizing content.

Learning styles are referred to and made by how certain people learn, categorize, and process new content. They are descriptors of common behavior patterns. Each person may have multiple preferred learning styles and these are preferences that have mild-strong inclinations.[11][12] Keefe formally defines learning styles as "characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how learners perceive, interacts with, and respond to the learning environment".[13] The three primary learning styles

are visual, auditory, and kinesthetic.[14][15] Kolb suggests to educate adult learners around the experiential cycle that reaches all types of learners.[16]

Plato defines adult learning style as "A free man ought not to learn anything under duress. Compulsory physical exercise does no harm to the body, but compulsory learning never sticks in the mind."[17]

7.3 Concepts of Pedagogy

Pedagogy most commonly understood as the approach to teaching, refers to the theory and practice of learning, and how this process influences, and is influenced by, the social, political and psychological development of learners. Pedagogy, taken as an academic discipline, is the study of how knowledge and skills are imparted in an educational context, and it considers the interactions that take place during learning. Both the theory and practice of pedagogy vary greatly, as they reflect different social, political, and cultural contexts.

Pedagogy is often described as the act of teaching. The pedagogy adopted by teachers shapes their actions, judgments, and other teaching strategies by taking into consideration theories of learning, understandings of students and their needs, and the backgrounds and interests of individual students. Its aims may range from furthering liberal education (the general development of human potential) to the narrower specifics of vocational education (the imparting and acquisition of specific skills). Conventional western pedagogies view the teacher as knowledge holder and student as the recipient of knowledge (described by Paulo Freire as "banking methods"), but theories of pedagogy increasingly identify the student as an agent, and the teacher as a facilitator.

Instructive strategies are governed by the pupil's background knowledge and experience, situation, and environment, as well as learning goals set by the student and teacher. One example would be the Socratic method.

The teaching of adults, as a specific group, is referred to as andragogy.

7.4 Simulated Teaching

Simulated Teaching is a teacher training technique which was developed by Cruickshank in 1968. It Is denoted by several terms such as Role Playing, Artificial Teaching, Pilot Training, Laboratory method, Clinical method and inductive scientific method. It Is one of the technique being used currently in India as well as in other Countries for the modification of teacher behaviour. Simulated teaching is an artificially arranged teachers training technique which helps the student teachers to learn the art and techniques through role playing. The dictionary meaning of simulation is the act or process of pretending or role playing. It Is a kind of imitation if a particular appearance or form. When a male child puts the beard and moustache on his face and the little girl serves the dishes to him they are said to simulate I.e imitate the acts of their parents. Through such simulated playful acts the children get the opportunity of training them for future life.

7.4.1 Parameters of Simulation

3 parameters of simulation.

1. Stylized simulation: in stylized simulation degree of participation is represented. Road maps, weather maps, graphs are the examples of stylized simulation.

2. Games: Games are marked by degree of comptetion. They are governed to some extent by rules which may be modified or even changed radically. Chess games and other games arc are the examples of Games simulation.

3. Free drama: in free drama degree of structure is taken into consideration. Free drama is the kind of simulation that might well be used in the classroom for such purposes as moral education.

7.4.2 Types of Simulation

Identity simulation: in identity simulation,the actual system is used as a model. Replication simulation: in replication simulation,an operational model of the system is used in its usual environment. Laboratory simulation: in laboratory simulation, replication is employed in the laboratory, with features of the real system represented. Computer simulation: Computer simulation is an abstract representation of the real system with the use of a computer. Analytical simulation: Analytical simulation uses mathematical models and attempts to get solution by analytical means.

7.4.3 Organisation of Simulated Teaching

The organisation of simulated teaching involved 5 to 7 student teachers who are to practice social skill. The one who teaches is called an Actor, two students assume the role of Observers and the trainees who play the role of students are called Foils.

CHARACTERISTICS OF SIMULATED TEACHING:

PLANNING:

Simulated teaching requires systematic advance planning to enable the students to display the desired behaviour(skills) after going through the training. Planning should be done while keeping in view the educational needs, interests, attitudes and pre-requisites of target group.

INVOVLEMENT:

The students are required to actively participate in all the activities. Simulated teaching demands a firm commitment and supportive behavior on the part of the students.

FEEDBACK:

The quality and frequency of feedback plays an important role in simulated teaching. It brings the desired change in human behavior. Simulated teaching allows the students to experience the consequences of their activities more quickly than real life situations. The immediate feedback thus received has more impact on their learning.

CONTROL:

simulated teaching is based on the system approach to achieve the specific objectives laid down before the students. Simulated teaching allows the teachers/trainees to determine what the students are to learn and in what sequence and under what conditions. To ensure full control over their learning, simulated teaching can be set in which the students solve or are encountered to relatively minor problems before they face those that are more serious and require greater skills and experience.

TIME:

Simulated teaching is goal oriented and flexible method of teaching. Depending on the objectives to be achieved time can be condensed or expanded, or both. If the objectives to be achieved are complicated or the skill to be acquired is difficult, simulated teaching can be expanded over a number of sessions.

SAFETY:

Simulated teaching minimises the risk in performing any activity in any artificial or mock or laboratory situation. Experience of performing operation of a patient, flying and driving an aircraft, fighting in a war and similar dangerous or risky situations can be given to them by providing artificial situations and mock trials.

7.4.4 Steps of Simulated Teaching

Flanders recommends the following steps:

1. **SELECTING PUPIL TEACHER'S:**
   A small group of pupil teachers is selected. Letters A, B, C, D etc. are assigned to each person in the group. Role assignments are rotated by letters so that each individual has a chance to be an actor or observer.
2. **SELECTING AND DISCUSSING SKILLS** :
   The skills to be practiced are selected and discussed. Topics of conversation that fit the skills are also suggested. Select one topic for the first session and decide on additional topics so that each individual has a chance to select one topic that makes him comfortable in his role.
3. **DECIDING CONSIDERATIONS :**
   Considerations as to who will start the conversation, who will intervene, who will stop the interaction and when it will be stopped are decided. Thus sequence of activities are to be determined.
4. **DECIDING PROCEDURE OF EVALUATION** :
   The procedure of evaluation, kind of data to be recorded and the method of recording etc. are decided.
5. **CONDUCTING PRACTICE SESSION :**
   First practice session is conducted and the actors is provided with feedback on his performance. If necessary the procedure of the second session is changed in order to improve the training procedure.
6. **PREPARED TO CHANGE THE PROCEDURE :**
   If need arises, one should be prepared to change the procedure and the topic and move on the next skill so as to present a meaningful challenge to each actor to keep his interest as high as possible.

   ADVANTAGES:

   1. Stimulated teaching is a device for motivating students.
   2. It provides opportunities to student teachers to study and analyse critical teaching problems.
   3. Simulation establishes a link between theory and practice.
   4. Participants recognize their own progress by various feedback methods.

5. Simulated teaching serves as a social laboratory. They can exercise the social skills acquired.

DISADVANTAGES :

1. It is time consuming.
2. It is difficult for beginners.
3. Not useful for all subjects.
4. It requires a lot of preparation on the part of the teachers.
5. It Is very costly.

7.5 Preparing the modules

Simulated learning modules (SLMs) were developed using practice-based scenarios grounded in effective communication competencies. The effect of the SLMs on Pharmacy students'

(i) Practice skills and (ii) Professionalism were evaluated.

SLMs integrating EXCELL competencies were applied in the classroom to study their effect on a number of learning outcomes. Excellence in Cultural Experiential Learning and Leadership (EXCELL) Program is a schematic, evidence-based professional development resource centred around developing participants' self-efficacy and generic communication competencies. Students (N=95) completed three hours of preliminary lectures and eight hours of SLM workshops including six scenarios focused on Pharmacy Practice and Experiential Placements. Each SLM included briefing, role-plays with actors, facilitation, and debriefing on EXCELL social interaction maps (SIMs). Evaluations comprised quantitative and qualitative survey responsed by students before and post-workshops, and post-placements, and teachers' reflections. Surveys examine specific learning outcomes by using pharmacy professionalism and pharmacy practice effectiveness scales. Responses were measured prior to the commencement of SLMs, after completion of the two workshops and after students completed their block placement. Self-report measures enabled students to self-assess whether any improvements occurred.

Student responses were overwhelmingly positive and indicated significant improvements in their Pharmacy practice and professionalism skills, and commitment to professional ethics. Qualitative feedback strongly supported students' improved communication skills and confidence. Teacher reflections observed ecological validity of SLMs as a method to enhance professionalism and communication skills, and suggested ways to improve this teaching modality.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the Steps of Simulated Teaching

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………………………………………………………………………………

2.Define Types of Simulation.

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7.6 LET US SUM UP

In this unit you have learnt the concept of Teaching Technology

7.7 UNIT- END- EXERCISES

1.Define Simulated Teaching

7.8 ANSWER TO CHECK YOUR PROGRESS

Simulated Teaching is a teacher training technique which was developed by Cruickshank in 1968. It Is denoted by several terms such as Role Playing, Artificial Teaching, Pilot Training, Laboratory method, Clinical method and inductive scientific method. It Is one of the technique being used currently in India as well as in other Countries for the modification of teacher behaviour. Simulated teaching is an artificially arranged teachers training technique which helps the student teachers to learn the art and techniques through role playing. The dictionary meaning of simulation is the act or process of pretending or role playing. It Is a kind of imitation if a particular appearance or form. When a male child puts the beard and moustache on his face and the little girl serves the dishes to him they are said to simulate i.e imitate the acts of their parents. Through such simulated playful acts the children get the opportunity of training them for future life.

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UNIT VIII THEORIES AND MODELS OF TEACHING

Structure

8.1 Levels of teaching

We all know that teaching is a purposeful activity. Through teaching the teacher brings a desirable change in the learner. Both the concepts teaching and learning are interrelated to each other. Development of all-round personality of the learner is the final goal of teaching and learning. During teaching an interaction takes place between an experienced person (teacher) and an inexperienced person (student). Here the main aim is to bring change in the behavior of the student.

Teachers teach students at three levels. They have to keep in mind about the developmental stage of the learners so that desired educational objectives can be achieved. These three levels are

Memory level: Thoughtless teaching

Understanding level: Thoughtful teaching

Reflective level: Upper thoughtful level

I'll be doing a separate article on these levels of teaching but for now, in this article, we will have the gist of all these three levels of teachings along with their advantages and disadvantages.

8.1.1 Memory level of teaching

It is the first and thoughtless level of teaching. It is concerned with memory or mental ability that exists in all living beings. Teaching at memory level is considered to be the lowest level of teaching. At this level, the thinking ability does not play any role. students only cram the facts, information, formulas and laws that are taught to them. the teaching is nothing but learning the subject matter by rote.[Bigge, Morris L(1967)] the role of the teacher is prominent and that of the student is secondary. The study material is organized and pre-planned. The teacher presents the study material in a sequential order. Memory level teaching lacks insight. Psychologically, it is cognitive level teaching.

Understanding level

Understanding something is to perceive the meaning, grasp the idea and comprehend the meaning. In the field of Education and Psychology, the meaning of 'understanding' can be classified as seeing the total use of facts

seeing relationship a generalized insight

The teaching at the understanding level is of a higher quality than the one at the memory level. It is more useful and thoughtful from the point of view of mental capabilities. At this level of teaching, the teacher explains the student about the relationship between principles and facts and teach them how these

principles can be applied. Memory level teaching barrier is essential to be crossed for this level of teaching

As compared to memory level teaching, the understanding level teaching has greater merit. This enables students to have complete command over subject material. In the understanding level role of the teacher is more active. The students at this level are second any. At this level, no cramming is encouraged. The new knowledge acquired at this level is related to the earlier knowledge gained. A generalization is made on the basis of facts and the facts are used in the new situations.

8.1.2 Merits of the understanding level of teaching

At this level of teaching students to make use of their thinking abilities.

Knowledge acquired at this level forms the basis of the reflective level of teaching.

Here the teacher presents subject matter before the students in an organized and sequential form. The new knowledge acquired is related to to the previously acquired knowledge.

Here the students do not learn by rote. Here they learn by understanding the facts and information and their use and purpose.

8.1.3 Demerits of the understanding level of teaching

Teaching at this level is subject centered. There is no interaction between the teacher and students at this level.

This type of teaching mastery ie emphasized.

8.1.4 Reflective level of teaching

This level is also known as introspective level. Reflecting on something means giving careful thought to something over a period of time. It also means thinking deeply about something.

Reflective level of teaching is considered to be the highest level at which teaching is carried out.
It is highly thoughtful and useful.
A student can attain this level only after going through memory level and understanding level.
Teaching at the reflective level enables the students to solve the real problems of life.
At this level, the student is made to face a real problematic situation. The student by understanding the situation and using his critical abilities succeeds in solving the problem.

At this level emphasis is laid on identifying the problem, defining it and finding a solution to it. The student's original thinking and creative-abilities develop at this level.
The role of the teacher in this level of teaching is democratic. He does not force knowledge on the students but develops in their talents and capabilities.
The role of the students is quite active.
reflective level of teaching is that which is problem-centered and the student is busy in original imagination.

Merits of memory level teaching

Useful for children at lower classes. This is because of their intellect us under development and they have a rote memory.

The role of the teacher is important in this level of teaching and he is free to make choices of subject matter, plan it and can present it at will.
The knowledge acquired at memory level teaching forms a basis for the future i.e. when student's intelligence and thinking is required.
Memory level teaching acts as the first step for understanding and reflective levels of teaching. It is pre-requisite for understanding level teaching.

Demerits of memory level teaching

This does not contribute to the development of the student's capabilities.

Since at this level student learns by rote, the knowledge gained does not prove helpful in real life situations as it does not develops the talents of students.
The pupils are kept in strict discipline and cramming is insisted on this teaching.
Intelligence does not carry any importance in this type of teaching and it lacks motivation

8.2 Theory of Advance Organizer Model

According to Ausubel (1962, 68), cognitive processes are those by which one acquires and uses knowledge, it is what most people mean when they speak of learning, especially school learning. Congnitive learning resulted in organized storage of informations in the learner's brain and his organized complex is referred to as cognitive structure. " Ausubel advocated that in course of meaningful learning, new information is linked with the existing concept in cognitive structure. However, learning is a dynamic process and both the new information and existing concept in cognitive structure are somewhat altered. In differentiated. This process may be taking place for days, weeks or years and as such it is significant to linkage of new information to the existing relevant

material occurs more deliberately. Hehce, the modified concepts in the cognitive structure are progressively differentiated and the progressive differentiation originates." "The process, by which conflicting meaning between different concepts are made clear, is refered to as the process of integrative recoinclliation. As a matter of fact, both subordinate learning and progressive differentiation take place simultaneously as concepts are made clear and the Integrative recoinciliation is obtained. Advance organizer serves to associate new information to previously existing relevant material in the congnitive structure of the learner so as to facilitate meaningful verbal learning."

8.2.1 Advance Organizer Model

According to Ausubel's theory of meaningful verbal learning, advance organizers are introduced in advance of new learning task and are formulated so that they take into account ideas and concepts already existing in the cognitive structure of the learner. They are presented at higher level of abstractness, generality and inclusiveness than the material to be learnt, and they serve to provide specifically relevant anchoring ideas- for the more differentiated and detailed material that is subsequently presented.

8.2.2 Types of Advance Organizers

" Ausubel labelled two types of advance organizers depending on the learner's degree of familiarity with the material which arc as follows : a) Expository Advance Organizers They provide general model of class relationship as a general subsumer for a new class, subclass and species before more limited subsumer are provided for the particular subclass or species. These are used when the material to be learnt is complete.

b) Comparative Advance Organizers They are used with relatively familiar material. They are designed to integrate new concepts with basically similar concepts existing in the cognitive structure, yet they are also designed to discriminate between the old and new concepts in order to prevent confusion caused by their similarity.

8.2.3 Description of The Advance Organizer Model

The Advance Organizer Model of teaching is described into different steps which are as follows i Syntax The Advance Organizer Model of teaching consists of three phases

Phase I : Presentation of Advance Organizer " During this phase, first of all objectives are explained and clarified, and after which advance organizer is presented.

Phase II : Presentation of Learning Task or Material At this stage, the learning material is presented. This is presented through lecturs, films, scripts, discussion, experiences, extra reading material etc. The learning material is organized in the logical order. Attempts are made to maintain motivation and interests.

Phase III : Strengthening Cognitive Structure At this stage, the cognitive material is strengthened. The purpose of this stage is to anchor new material

with old. That is ‘ Integrative recoinciliation ’ is brought about. This is brought about by asking the students to prepare the summary of major attributes of new materials, repeat definitions and ask students to differentiate the closely related subjects.

ii Social System :

In this model, the teacher retains control of the intellectual structure as it is necessary continually to relate the learning material to the organizers and to help students differentiate new fnaterial from previously learnt material.

iii Principles of Reaction :•

The teachers solicited or unsolicited responces to the learner’s reactions are to be guided for the purpose of clarifying the meaning of the new learning material, differentiating it from and recoinciling it with existing knowledge making it personally relevant to the student and helping to promote a critical approach to knowledge.

iv Support System Well - organized material is the critical support requirement of this model. The effectiveness of the advance organizer depends on an integral and appropriate relationship between the conceptual organizer and the content.

V Instructional and Nutural Effects : The instructional effects of this model are conceptual structures, meaningful assimilation of information and ideas. The model nurtures an interest in an inquiry and precise habits of thinking.

Characteristics of Advance Organizer Model

The Characteristics of Advance Organizer are as follows

i Advance Organizers include short set of verbal or visual information.

ii Advance organizer is presented in the begining of the lesson.

iii Advance Organizers contain no specific content from the to-be - learned material.

iv They provide the means of generating logical relationships among elements in the to - be - learned information.

V They influence the learner’s encoding process.

vi They have greater effect on retention than on learning.

vii Advance Organizers tend to aid lower ability learners more than higher ability learners

Applications of Advance Organizer Model

The model has the following applications at the different levels:

i The advance organizer model is especially useful to structure extended curriculum sequences or systems, actually in the key ideas in the field.

ii h increases the learners graspe of factual information linked to and explained by the key ideas.

iii The model can also be shaped to teach the skills of effective reception learning.

iv Whenever ideas or information needs to be presented, renewed or clarified, the advance organizer is useful.

v The activities designed to strengthen cognitive organization can be spontaneously applied to the clarification of ideas in whatever instructional context, as can the technique of an organizer

8.3 Jurisprudential Inquiry Model

Jurisprudential Inquiry Model was developed by Donald Oliver and James P. Shaver (1974) to help students to learn to think systematically about contemporary issues. This model aims to develop the capacity for analyzing

issues, to assume the role of others and social dialogue. Emphasizing the role of this model in value education. Joyce and Well (1985) write, "Jurisprudential Inquiry Model is essentially useful in helping people rethink their positions on important legal, ethical, and social questions ....By giving them tools for analyzing and debating social issues, the jurisprudential approach helps students participate forcefully in the redefinition of social values."

Resolving complex, controversial issues within the context of a productive social order requires citizens who can talk to one another and successfully negotiate their differences. This model is developed to improve students' ability to analyse public issues and to develop and clarify value positions which they can use in the public domain. Oliver and Shaver are of the opinion that the best stance on an issue is to maintain a balance of values in which each value is only minimally compromised. To achieve such a balance, each party in a controversy should try to understand the reasons and assumptions behind the other's position. Only by rational consent useful compromise can be reached.

Socratic Dialogue

The heart of jurisprudential inquiry teaching is socrati c dialogue. In the socratic style, the teacher asks the students to take a position on an issue or to make a value judgement, and then he or she challenges the assumptions underlying the stand by exposing its implications. The function of the teacher is to probe the students positions by questioning the relevance, consistency, specificity and clarity of the students' ideas until they become more clear and more complex. Most characteristic of the socratic style is the use of analysis as a means of contradicting students' general statements.

Origin of the Problem

At present Indian education is facing value crises. Ours is an age of value transition. Joyce and weil (1982) have proposed Jurisprudential inquiry model of teaching. It was designed to teach directly the jurisprudential framework, a commitment to pluralism and respect for alternative views and ability to carry on a dialogue to develop social policy. The investigator is of the opinion that this model can be effective for developing democratic values among school children. This view prompted the researcher to prepare this research proposal.

Objectives of the Study :

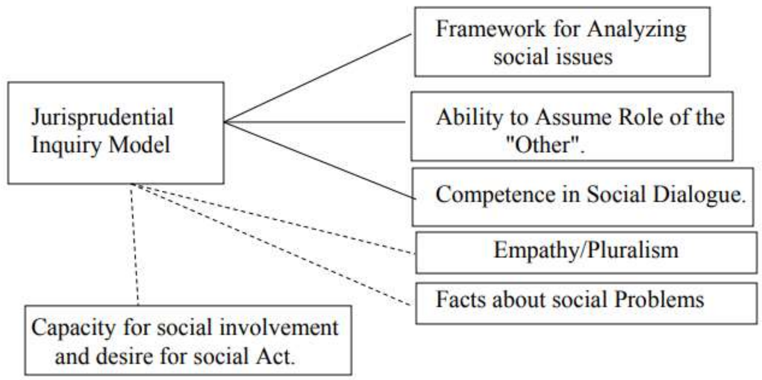
The present study aims at achieving the following objectives :

1. To see the effectiveness of jurisprudential inquiry model of teaching for developing democratic values among VIIIth grade school Children.
2. To see the effects of socio-economic status on development of democratic values among VIIIth grade school children when taught through jurisprudential inquiry model of teaching (JIMOT).
3. To see the effect of social competence on development of democratic values among VIIIth grade school children when taught through jurisprudential inquiry model of teaching (JIMOT).
4. To see the effect of personality factors on development of democratic values among VIIIth grade school children when taught through jurisprudential inquiry model of teaching (JIMOT).
5. To see the effect of academic achivement on developing of democratic values among VIIIth grade school children when taught through jurisprudential inquiry model of teaching (JIMOT).

The Rationale of the Study

The investigator wants to inculcate democratic values among school students who possess the potentiality to solve their value conflicts and are conscious of their social and moral obligations. This task can be accomplished by teaching

certain public issues through Jurisprudential enquiry model of teaching. This hunch led to the origin of the problem to study the effectiveness of this model. The rationale for the present study entitled "Effectiveness of Jurisprudential Inquiry model of Teaching for developing democratic values Among VIIIth grade students in relation to their socio-economic status, social competence, personality factors and academic achivement" has been provided by instructional and nurturant effects of the model developed by Joyce Bruce and Marsha Weil



Based upon these instructional and nurturant effects, the investigator has developed his own experimental Model to see the effectiveness of Jurisprudential Inquiry Model (Independent variable) for developing Democratic values, Socio-economic status, Social competence, Personality Factors, Academic Achievement

Delimitations of Study

The study has limited generalizability in the sense that the effect of Jurisprudential Inquiry Model of teaching has been studied in terms of Democratic value, Socio-economic status, Social competence, Personality Factors and Academic Achievement. Though there are so many variables (such as Attachment, expressiveness, self-control, social knowledge, perspective taking, moral judgement ability, participation skills, political socialization, political knowledge, political interests and participation, political efficacy and cynicism, social value, justice, equality liberty, fraternity had secularism upon which the effectiveness of JIM could be studied, all of them could not be studied at a time due to lack of resources and time at investigators disposal.

8.4 Presage, Process and Product

Presage-Process-Product (3P) model provides a flexible model for testing hypotheses about intra-psychic and contextual effects on student learning processes and outcomes; however, few empirical studies have effectively tested the longitudinal and reciprocal effects implied by the model. The current study provides an empirical test of theorized reciprocal relationships operating over time implied by the 3P model between perceived teaching quality and approaches to learning. The current study examines a longitudinal sample of Japanese university students (n=1348; female=404) from 18 degree programs. Data from a reciprocal latent model were analysed using structural equation modeling. Modeling identified significant reciprocal effects between teaching quality and

deep approaches to learning. Deep (positively) and surface (negatively) predicted annualised GPA (moderate and large effects respectively). Consistent with a systems theory perspective on teaching and learning, longitudinal results supported hypothesised reciprocal relationships between perceptions of teaching quality and approaches. Implications for theory and practice are discussed. Student learning research within higher education has matured during the past decade. The burgeoning nature of this field is marked by its salient transition from exploratory to confirmatory studies, employing and testing a priori models such as Biggs' 3P model (Presage, Process, Product; Biggs, 1978, 1985, 1993). This growing body of research has employed increasingly sophisticated analytical approaches such as path analysis (Richardson, 2006) and structural equation modelling (Ginns, Martin, & Papworth, 2013), thereby testing longstanding theoretical connections between teaching and learning (e.g., Richardson, 2006). In addition to the growing sophistication of the field, recent meta-analyses (e.g., Richardson, Abraham, & Bond, 2012; Schneider & Preckel, 2017) have signaled both the current state of the field and important directions for future research: "Further prospective studies testing multivariate models with large samples are needed. Ideally, these would include applicants (before arrival) and first-year students followed up through their student careers." (p. 376). The current study aimed to build upon the above studies by employing sophisticated longitudinal modeling across one academic year at university. Thereby, we examined the predictive relationships between students' approaches to learning and their achievement, and tested the reciprocal relationships between teaching and learning suggested by the 3P model and supported by past cross-sectional research (Richardson, 2006). The 3P model of student learning has played a substantial role within Student Learning Theory (i.e., a student-centred theory which includes approaches to learning and perceptions of the learning environment: SLT; Biggs, 2003; Ramsden, 2003) as a flexible model of the interface between motivation and processing, as well as the interaction between the students' perceptions of the learning environment, studying/learning behavior and learning outcomes. The model posits that students adopt qualitatively different approaches to their studies as a function of intrapersonal presage factors (e.g. prior ability; socioeconomic status) and contextual presage factors (e.g. perceptions of the quality of teaching, as well as assessment and workload requirements). The intuitive appeal of the surface and deep approaches to learning dichotomy, and intrinsic connections between deep learning and students' integrated understanding has led to these concepts being used within many university instructors' curricular goals and day-to-day language (Pintrich, 2004). Institutions have also implemented SLT's model of the teachinglearning environment as a means of understanding the university experience in countries such as Australia (Barrie, Ginns, & Prosser, 2005; McKinnon, Walker, & Davis, 2000). Informed by systems theory, the 3P model incorporates the potential for feedback loops (see Figure), which by necessity operate over time. There are, however, relatively few longitudinal tests of the model, representing a major empirical gap in SLT. The current study aims to address this gap by employing a cross-lagged panel approach.

8.5 Use of Animation Films for the Development of Children's Imagination

child is unable to grasp the concept and narrative of the animation that he watches. According to Jean Ann Wright in her book Animation Writing and Development, while an infant still unable to sits by themselves, they enjoying watching television just by paying attention to the changing patterns of light colours and sounds. Therefore, at this sensory-motor stage, animation for them is just the same as other forms of entertainment as they just paying attention to the basic forms, movement and colours. Their lacking of object permanence ability not allows them to understand the existence of a character in the movie. As they move to different stages, they start to explore the world around them. They begin to learn about language and symbols as a representation of actions. They will start to interact with things that they watch until finally they are able to grasp the content of the animation that they watch.

As they enter the pre-operational stage, narratives and characters in animation start to have influences on their development. Although they still see things very literally, they start to pay attention at the setting of the event, and as they developing language ability, they will start to imitate the movement and dialog of the character in the animation, although they still unaware of the traits that the particular character possess. They are still relating the character in the animation to them limited to what is literally shown in the movie. Their egocentric thought allows them to relate at the character in the animation in a very narrow point of view.

During the Concrete operational stage, a child is now able to relate the characteristic of the character to him to an extent of what a character is being portrayed in the animation. Without his egocentric thought he is able to see the character from other point of view. For example if he watches a Aladdin, he is not only seeing Jasmine as a beautiful princess but also taking the point of view of Aladdin as a princess that want to be free and his lover. But he still need a concrete situation in the movie to help him understand the character from other point of view. And lastly during the formal operational stage, a child is now able to fully relate himself to the character in the animation. He also begins to grasp the concept and morale behind it rather than using an image representation to relate to the character. He is now able to relate himself to the character abstractly using his logic. He is now able to think what possibilities that the character might behave in the movie even if it is not shown in any scene. Animation has the most impact at this stage, where a child can relate himself to many things from the character other than what the animation showed in the narrative. He will memorize lots of symbols regarding his surroundings.

Let's take an example of how a child in formal-operational period can relate himself to violence aspect in animation. Does watching too much violence in animation will leads a child into a violent teenager? For example, a child at this stage will see a gun as a symbol of killing. But at the same time it does not necessarily cause a child to act more violently. As a gun can also symbolize justice where in the movie a hero use it to shoot the villain. It can promote a view that violence is common in everyday life, which will make them think that the world around them is a mean and dangerous place. Therefore it will create fears in their minds. Or it can create the opposite effect that having a gun will make a child feel safe. The ability of abstract thinking that a child at formal-operational period possessed will make a child have a different point of view compared to others.

Check Your Progress
Notes: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of the unit.
1. What are the Characteristics of Advance Organizer Model……………………………………………………………………………
……………………..……………………………………….………………………………………………………..………..…………………………………………
2.Define Presage, Process and Product
………..…………………………………………………………………………………………….………………………………

8.6 LET US SUM UP

In this unit you have learnt the concept of Theories and Models of Teaching

8.7 UNIT- END- EXERCISES

1.Define the Description of the Advance Organizer Model

8.8 ANSWER TO CHECK YOUR PROGRESS

Phase I : Presentation of Advance Organizer " During this phase, first of all objectives are explained and clarified, and after which advance organizer is presented.

Phase II : Presentation of Learning Task or Material At this stage, the learning material is presented. This is presented through lecturs, films, scripts, discussion, experiences, extra reading material etc. The learning material is organized in the logical order. Attempts are made to maintain motivation and interests.

Phase III : Strengthening Cognitive Structure At this stage, the cognitive material is strengthened. The purpose of this stage is to anchor new material with old. That is ' Integrative recoinciliation ' is brought about. This is brought about by asking the students to prepare the summary of major attributes of new materials, repeat definitions and ask students to differentiate the closely related subjects.

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BLOCK III
APPLICATION OF INFORMATION COMMUNICATION TECHNOLOGY IN EDUCATION

UNIT IX INFORMATION AND COMMUNICATION TECHNOLOGIES IN EDUCATION

Structure

9.1 INTRODUCTION

Individualized instruction provides different tasks for each learner and provides support at the individual level. It is based on the idea that all learners are different and therefore have different needs, so an individualized or personally tailored approach to instruction ought to be more effective, particularly in terms of the tasks and activities that pupils undertake and the pace at which they make progress through the curriculum. Individualized instruction is about using

teaching strategies that connect with individual student's learning strategies. The ultimate goal is to provide a learning environment that will maximize the potential for student success. The rapid growth in ICT has brought remarkable changes in the twenty-first century, as well as affected its adoption and integration by teachers in teaching-learning process. The effective integration of technology into classroom practices poses a challenge to teachers and administrators. In this unit mainly focus on how the ICT is used in teaching and learning process

In this unit, the concepts of knowledge acquisition, communicative skills for teachers and students, individualized instruction, programmed learning, ICT integration and challenges in Education will be explained

- understand knowledge acquisition and multi-sensory approach
- discuss the ways to develop the Classroom Communication
- know the different Communicative skills for Teachers and Students
- define the concept of individualized instruction
- differentiate between various styles of programmed instruction
- acquire the skills to develop programmed learning material
- enumerate the changing roles of the teacher in ICT
- describe the roles of the learner and the teacher in ICT
- identify the challenges of integrating ICT in Education

9.2 ICT in Education

Information and Communication Technology (ICT) in education is the mode of education that use information and communications technology to support, enhance, and optimise the delivery of information.

Worldwide research has shown that ICT can lead to an improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in the use of ICT in education with integrating technology to the curriculum has a significant and positive impact on students' achievements. The results specifically showed that the students who are continuously exposed to technology through education has better 'knowledge', presentation skills, innovative capabilities, and are ready to take more efforts into learning as compared to their counterparts.

9.2.1 Importance, Advantages and Limitations Information and Communication Technologies in Teaching

"Smart technology" is the familiar terminology that is widely being used in every being's life. Smartphones, tablets, gadgets, smart televisions, etc., are the products of smart technology that have made human life smarter, easier and accessible. Smart technology has not only enhanced the way of living but also became an integrated part of everyone's life. The Information and Communication technology to be precise has become a driving force behind economic growth and a developmental tool as well.

ICT is an extended term for Information technology which is a technological source to make information available at the right time, right place in the right form to the right user. Earlier, one had to wait for the newspapers to get the information across the world. Now with the smarter technology, information can

be accessed from anywhere using smartphones and gadgets. All this is made possible with the help of Information and Communication Technology. Information technology has been influencing our lives in the recent years in the fields of education, healthcare, and business. Going an extra mile, Information and communication technology in schools has had a major impact.

Information and communication technology in schools can be used as a school communication tool to improve student learning and better teaching techniques. With the advancement of technology in education, schools adopt school communication software to transmit, store, share or exchange information. In this technological era, ICT in education has compelled many schools to get accustomed to smart technology. This school communication software uses computers, the internet, and multimedia as the medium of communication.

Computer-based learning: Computer-based learning is one of the modules of school communication tool that helps students to enhance their learning skills through computer aided education. It imparts computer knowledge in students and enables them to obtain large amounts of information from various websites. After two decades of introducing computers to schools, education has been revolutionized ever since then. It reduces time spent on mechanical tasks such as rewriting, producing graphs and increases the scope of searching. It not only helps in finding information but also in organizing information making it easier to share with others.

Internet: Internet tools like Email, social networks, newsgroups and video transmission have connected the world like never before. Students can now communicate using emails and social networking groups that provide knowledge based information. Distance learning, online learning is also enabled through the internet. Students can learn online and also talk to experts online. Notes, readings, tutorials, assignments can be received by students from anywhere. The Internet provides major information in texts, audios, videos and graphics which can be accessed by the individual. Online learning allows students to interact with each other and faculty to interact with students.

Classroom Learning: With the introduction of ICT in education, classroom learning is one attribute that makes learning experiential and experimental to students. Students can listen to the instructor or teacher, receive visual cues through PowerPoint images, handouts or whiteboard lists and participate actively. This helps in immediate interaction and students have opportunities to ask questions and participate in live discussions. This school communication software module further benefits in building and maintaining personal and professional relationships as classrooms offer greater personal contact with other students and teachers.

Video conferencing: This is yet another medium of communication wherein students can communicate with other students or instructors online. It enables students to become active participants in their own learning. Video Conferencing is a powerful communication tool that has the potential to change the way we deliver information to students. It is just one of the today's integrative technologies that empower students to prepare for a better future.

Here are few characteristics that make ICT in education a prominent school communication tool.

It offers the wide variety of services.

It is reliable and provides interactive learning experiences.

It is flexible and provides comfortable learning.

It motivates students to learn.
It facilitates communication and promotes creativity.
It also provides access to the digital library where information can be retrieved and stored beyond textbooks.
The use of ICT in education adds value to teaching and learning, by enhancing the effectiveness of learning. It added a dimension to learning that was not previously available. After the inception of ICT in schools, students found learning in a technology-enhanced environment more stimulating and engaging than in a traditional classroom environment.

Advantages

Go through the bullet points and you will get my point.
In the education system, you can know more about newly invented technology.

- Actually, you can achieve the latest knowledge.
- If you study with ICT then there is a big open scope for developing the entire sector.
- In business, you can analyze and read reviews of the customer.
- Demands of products can be statistically measured through ICT.
- You can keep knowledge about your competitor products and services.

Disadvantages

There are some disadvantages of ICT in society. Check it.
Some anonymous person uses ICT in an illegal way to create conflict in our society.
Many people spread fake news using ICT and sometimes it creates a great problem.
Some of you may subject to unwanted blackmail for your losing personal data and information.

9.3 Limitations Information and Communication Technologies in Teaching

Students tend to focus on superficial presentations and copying from the Internet.

Students critical thinking and analytical skills. ... **use** oral skills and hand writing
All of us understand things in the light of our past experience. This is also true of 'learning' – we get our ideas of what 'learning' means from what happened to us in the past. So, for example, we may think of 'learning' as something which takes place in a school or college, in a classroom. We may think of it as a person sitting alone at night, trying to memorise a lot of facts so that s/he can pass an examination. However, a bit of reflection will show us that 'learning' is much wider than that. After all, children learn a great deal before they even get to school - they learn to speak, to walk. Educational psychologists tell us that any activity which leads to a change in our behaviour is 'learning'.

1.Here are some more ideas about 'learning':

Learning can be formal or informal. We learn informally from what we experience day by day: things which happen to us make us change the way we think and act. We may not even be aware that we are learning, which may cause problems - for example, health workers may learn bad attitudes from the example of others. Of course, learning may also be formal: we attend a course which is planned in a structured way, in a school or college.
We don'tjust learn knowledge and facts - we also learn skills and attitudes. This is especially important for health workers, since it is in our practical work that we have an effect on the health of the people we serve. Interestingly, we learn knowledge, skills and attitudes in different ways - for example, we may learn a new idea from a discussion, but we learn skills by practising them and getting feedback.
People learn in different ways. Researchers have identified different 'learning styles'.

2 Some people are 'receivers': they like to memorise what is given to them. This is a very common style, and it is reinforced by teachers who expect students to memorise, and reward them for it. Other people are 'detectives': they like to investigate what they are learning themselves, to get to understand it. Yet others are 'generators': they like to decide themselves what they want to learn, and then look for opportunities to learn those things.

Learning can be superficial or deep.3 If knowledge is only memorised (superficial learning) it is soon forgotten, and may never affect the way that person does her/his work. If the learner is made to use the new knowledge actively, the learning becomes deep. The learner connects the new knowledge to the concepts that s/he already has, and understands how it can be used practically. It is, therefore, much more likely to be remembered and used.
Motivation is important for learning.4 What is it that makes people want to learn? Some learn because they want to do a better job - they get satisfaction from the feeling that they are competent. People are also very strongly motivated by the hope that they will be rewarded - for instance, by gaining a qualification, leading to a promotion and better pay. The need to pass exams is therefore a very strong motivator.
Learning continues throughout a person'slifetime - at least informally. We all know that health workers should continue to learn throughout their careers, because new information about health is constantly becoming available. However, many workers do not have access to formal in-service training. This means they themselves have to take the responsibility for staying up-to-date - they have to become 'life-long learners'.

9.3.1 Teaching Learning Contexts and the Need for ICT Devices and their Applications

Information technology has taken the educational landscape by storm, increasing thelearning potential of students and empowering teachers with engaging presentation tools andadvanced class-management systems. From preschools to institutions of higher education, aplethora of electronic devices -- laptops, tablets, smartphones, and even smart-boards hasopened access to vast amounts of information. These tools promote wider participation in theacademic community and benefit educators and students alike for (i) Knowledge explosion(ii) Preservation and (iii) Retrieval.
ICT-mediated learning activities. According to the observed, following the trend of the previous data The most straightforward model of access for ICT

in Warschauer's theory is devices. In this model, access is defined most simply as the ownership of a device such as a phone or computer. Warschauer identifies many flaws with this model, including its inability to account for additional costs of ownership such as software, access to telecommunications, knowledge gaps surrounding computer use, and the role of government regulation in some countries. Therefore, Warschauer argues that considering only devices understates the magnitude of digital inequality. For example, the Pew Research Center notes that 96% of Americans own a smartphone, although most scholars in this field would contend that comprehensive access to ICT in the United States is likely much lower than that.

9.4 Internet

Internet is not only an access to websites, these days there is knowledge and information on every aspect of the educational world over the Internet. The resources provided on various web pages are indeed very informative and useful for professionals and students related to every field of work. The only pre-requisite is the research over the Internet for a specific educational topic, and then this information just needs to be filtered to gain the basic knowledge of what you are looking for. Therefore, these are true internet resources which deal with every individual's educational needs. Internet has also provided the opportunity to study online in the context of e-learning, m-learning and virtual learning. There are virtual universities set up, in which the students can take classes siting on the computer seat opening the university's website video section according the topic, and then study at home. This unit creates an opportunity to the learners to learn the concept of Internet and its educational uses.

In this unit, we will discuss Internet, E-mail, Search Engines, Info-Savvy Skills, Digital Age Skills, Safe Surfing Mode and Internet resources for different disciplines like natural sciences, social sciences, Humanities, and Mathematics. And also this unit describes the concept of E-learning, Mobile-learning, On-line learning, Virtual classroom, Smart Classroom, Wikipedia, Massive Open Online Courses (MOOCs) and Social networking

Use of Internet

- Electronic mail. At least 85% of the inhabitants of cyberspace send and receive e-mail. Some 20 million e-mail messages cross the Internet every week.
- Research.
- Downloading files.
- Discussion groups. These include public groups, such as those on Usenet, and the private mailing lists that ListServ manages.
- Interactive games. Who hasn't tried to hunt down at least one game?
- Education and self-improvement. On-line courses and workshops have found yet another outlet.

- Friendship and dating. You may be surprised at the number of electronic "personals" that you can find on the World Wide Web.

- Electronic newspapers and magazines. This category includes late-breaking news, weather, and sports. We're likely to see this category leap to the top five in the next several years.

- Job-hunting. Classified ads are in abundance, but most are for technical positions.

- Shopping. It's difficult to believe that this category even ranks. It appears that "cybermalls" are more for curious than serious shoppers.

9.4.1 Learning Outcomes

After going through this unit, you will be able to:

- explain the basics of Internet, E-mail and Search Engines
- discuss the concept of Info-Savvy Skills, Digital Age Skills and Safe Surfing
- identify and use the Internet resources for different disciplines
- describe the concept of e-learning: Mobile-learning and On-line learning
- explain the meaning of Virtual classroom and Smart Classroom,
- identify the uses of Wikipedia in education
- recognize the importance of Massive Open Online Courses(MOOCs)
- describe the educational uses of Social networking sites

Internet is the world's largest computer network, the network of networks, scattered all over the world. It was created nearly twenty-five years ago as a project for the U.S Department of Defense. The Internet is a global network of computers that allows many millions of computer users to share and exchange information. Internet is a rich source of information. Many thousands of computers are linked to the Internet, hold vast quantities of data that you can access from your personal computers whenever you want. Teachers, students, businessmen, doctors, engineers, scientist etc. can get recent data from internet which makes their knowledge up-to-date. Accessing the information through internet is much faster. Information can be downloaded into the computer and print out can betaken.

Origin and Development of the Internet

1957	ARPA was formed
1969	ARPANET was commissioned for research into computer networking.

1971	E- mail and e-mail utility became available
1973	First international connections to ARPANET. University College of London and Royal Radar Establishment, Norway.
1974	Telnet
1975	Operational management of the internet transferred to DCA (DISA).
1979	USENET; ARPA established the internet Configuration Control Board (ICCB).
1982	TCP/IP suite declared as standard of Department of Defense.
1983	MILNET separated from ARPANET.
1984	Domain Name System introduced; number of hosts exceeds 1000.
1985	Domain name registration system introduced
1986	NSFNET was established; IETF and IRTF came into existence under the IAB.
1988	Internet Relay Chat developed.
1989	Number of hosts exceeds 100,000.
1990	ARPANET ceases to exist; Dial up internet connections by ILSPs
1991	WAIS, Gopher and World Wide Web.
1992	Internet Society is chartered; Number of hosts breaks 1,000,000 Veronica released.
1993	Business and media take note of the internet; Mosaic takes the internet by storm.
1994	ARPANET /internet celebrates 25th anniversary; shopping malls on the internet.
1995	NEFNET reverts back to research network Main US back bone traffic re- routed through interconnected network providers. Search engines developed.
1996	Government restrictions on the internet use around world.

9.5 World Wide Web (WWW)

Many people believe that both internet and World Wide Web (WWW) are same. But, actually it is not true. WWW is a type of service in the internet. i.e., Internet is the backbone of communication systems whereas WWW is a type of service that uses communication systems. A Web is a collection of Web sites and the Internet is a network of networks. WWW is nothing but the collection of Web sites on the Internet and the sites are all linked together somewhat like the strands of a spider web. The World Wide Web is often abbreviated as the Web or WWW of W3. WWW was created in 1989 by the Tim Berneis Lee at the European laboratory for particle physics (CERN) in

GENEVA, Switzerland to enable the document communication between the physics researches and to create a network between them, physics researches created hypertext documents as their documentation standards. The WWW contains huge amount of information which a user can access using a browser such as Internet explorer or Netscape Navigator. The documents accessed are in the form of web pages. Web pages may contain text, graphics, icons animation, sounds and video – multimedia capabilities and are usually user –friendly.

- Website: A Web site is a collection of interconnected Web pages. Usually there is a main or home page which provides link to the other pages and vice versa. Each page (document) has its unique URL.
- Uniform Resource Locator (URL): The originator Berners-Lee invented a coding system that uses a string of characters called a Universal Resource Locator (URL) that identities the name and address of each document on the Web. The URL consists of four major parts: For example:

  Type of Site File Name
  http : //www . google. com/
  index.html Server Protocol DomainName

  - ✓ Server Protocol: Web documents use the Hypertext Transfer Protocol(HTTP)
  - ✓ Type of site: For example, WWW for World Wide Web, FTP for file Transfer Protocol.
  - ✓ Domain address: The address of the host computer consisting of the name of the main server or site, the sub domain (organisation, network etc.), and the domain name (a two – or three – letter) designation indicating the type of organisation etc. (see below for moreclarification)).
  - ✓ Folder or Filename: The folder (subfolders etc.) or/and the name of the file or document accessed.
- Web Language: HTML (Hyper Text Markup Language) has become as the standard Markup Language or information publishing.
- Web pages: A webpage is a HTML document that is stored in a web server and that has an URL so that it can be accessed via the web. It is a single unit of information often called a document. It consists of text, images, background and colour effects, links, java applets, vb scripts etc.
- Home Page: A home page is the front door of the web site. When the web user is typing a website name in the browser, the homepage will be displayed first.

  Web Browsers: A Web Browser is a software tool that computers use to communicate with web servers on the internet. Web browsers enable to download and display the web pages that user requests. A Web Browser should be capable of understate HTML and display text. Now Web Browser supports

pictures, video, sound and even 3D images. In the address bar of the browser, type the URL and it will display the web pages. The famous browsers available are

- ✓ Microsoft Internet Explorer (IE): This browser is shipped freely with almost all products of Microsoft and is tightly coupled with the operating system. It comes with outlook express, an e-mail client for downloading the e-mail messages from the server to the local machine.
- ✓ Netscape Navigator: Netscape offers a close competition to Microsoft and it offers a better support to display java applets than IE. Netscape also offers the email client besides other functionalities like HTML editor and calendar.
- ✓ Others: Opera, Konqueror and Mosaic are some of the other popular browsers in the market.

9.6 Application of Information and Communication Technologies in Classroom

Application of ICT in Education in India: In India, application of ICT in Education was started few years back and it has touched the every aspect of human life and it has become a vital part of our daily life. Presently ICT in India has greater potentialities and a promising future because our country possesses one of the largest ICT workforces in the world and there is a growing awareness building among the educationists, stakeholders on the emerging role of ICT in enhancing the process and out-come of education In 1975-76, Satellite Instructional Television Experiment, a Satellite based educational programme was introduced in India and the programme related to health and hygiene were telecast to more than 2000 villages covering six states of India. The INSAT satellites were land mark in the history of Indian educational Technology. The Educational television broadcasts started through INSAT satellite in 1982 in Orissa and Andrapradesh and after that they were extended to some other states like, Bihar, Maharastra and Uttarpradesh. Now INSAT cover whole country and a Variety of educational programmes are being telecast by it, as the vital aim of the IINSAT is to bring the rural people into national mainstream. Another Satellite, EDUSAT, a satellite for Education purpose was launched in 2004. The National Policy on Education 1986, as modified in 1992, stressed the need of Educational Technology to improve the quality of education. The Curriculum Framework (2005) also highlighted the significant role of ICT in School Education. Sarva Shiksha Abhijan (SSA)- a mission of the Indian Government to achieve the UEE , also stresses the importance of ICT in educational sector and the Central Advisory Board of education (CABE) also in its report on Universal Secondary Education-2005 featured the comprehensive use of ICT as one of the most important aspects of schooling . Presently the government of India has taken various initiatives to integrate ICT in educational sector to facilitate information dissemination and communication in every area of education. Our Prime Minister, Narendra Modi said that Information Technology is becoming the growth engine which has the potential to transform India into a Knowledge Economy and Society. Even though computer have been introduced in schools in India, The education system has largely not been influenced by the potential for pervasive change intrinsic to ICTs .Hence a proposed increase in the spending on ICTs in school education from less than Rs. 1000 Crore in the 10th Five year plan to more than Rs. 6000 crore in the

11th five year by MHRD could reflect an urgency to harness ICTs for systematic change in the education sector. In the 12th five year plan, special stress has been given on enhancing facilities in schools especially on ICT .The stress laid on implementing ICT in elementary level by replacing the erstwhile Computer Aided Learning (CAL)under SSA which would include provision of networked computers, accessories and an Internet connection in a phased manner .Development of Pedagogically appropriate e-content in local language and a variety of software tools to serve the school curriculum have also been given special emphasis . This will focus to enable students and teachers to access wide variety of resources indispensable integrated in classroom available in the digital format, store over, efforts to made to the cost-effective and efficient ICT solution have also given special emphasis.

9.6.1 Benefits of ICT application in Education

The benefits of ICT application in education can be summarized as bellow: ICT increases the access to education. It improves the quality of education by developing new ways of interaction and also makes teaching –learning process more interesting. It provides equal opportunities to the large number of learners to obtain education and information. It provides specialized tools for learners with visual, hearing or mental impairment, so that they learn and acquire knowledge at their own pace. It provides support to each and every school in sharing educational / learning experiences with the different schools throughout the country. It enables the distance education system to be more effective. It helps in promoting technology literacy to every citizen and especially to young stars. It provides opportunities for lifelong educations. It enhances the teacher's quality both in terms of teaching and research

9.7 School Management and for Professional Development of Teachers.

School can be seen as an institution that both upholds and reforms tradition. School is a sanctuary of closed knowledge, protecting its educational autonomy with every means available. The closed code of school can be contrasted with, for example, the open code of the Internet. For the media-savvy teacher, Communication Technology constitute a never ending source of information and pedagogical challenges, as they provide an opportunity to establish virtual classrooms uniting school classes in different parts the world. In a progressive school, Communication Technology might serve a fundamental pedagogic purpose of generating discussions across all barriers.

Education is a learning cycle without an end. It is not going to stop after graduation and starting a career. Continuing education helps career-minded individuals to continually improve their skills and become more professional at their work. It is particularly important for school administrators in the field of primary and secondary education management to enable professional development for teachers, not only to give their students the best learning results but also to be more effective and fulfilled throughout various other aspects of their job.

Better Learning Outcomes for Students

Educational technology, guidelines for school districts, and standards for curricula are continually changing. This makes it challenging for teachers to keep up with trends and best practices in the field. Professional development for teachers turns teachers into stronger and more fitting teachers by allowing them to produce useful and personalized lessons for the students today. Research has shown that as a result of student achievement will increase by as much as 21 percentile points as a result of professional development for teachers. Professionalism in teacher education is the dire need of the hour. Knowledge and experience alone are not enough for teachers in their entire careers to supporting them. National Board Certification is one option for teachers abroad for seeking professional development and for adhering to the current educational standards to ensure optimal learning for students. Studies have supported that students taught by the teachers who had National Board Certification had higher scores in all subjects as compared to the students of the teachers without a National Board Certification.

Teachers Find New Ways to Teach

Through discovering new teaching strategies through professional development for teachers, educators can go back to the classroom and make changes to their teaching styles and curricula to better suit their students ' needs. Nonetheless, these improvements are difficult to assess, as they are usually introduced slowly. Through introducing educators to new delivery techniques, assessment styles, and record-keeping approaches, professional development for teachers makes them more effective in their presentations and course assessments.

Teachers Develop Better Skills in Organizing and Management

Much of the teachers' time is spent on student evaluations, curriculum development, and other paperwork in addition to the hours spent in classroom preparation. Professional development for teachers can help teachers to plan their time better and stay organized. This makes teachers more efficient and gives them extra time to focus not on paperwork but students.

Teachers Gain Knowledge and Insight into Industry

Students expect teachers to be specialists in the subject matter for the topics they teach. Professional development for teachers ensures that teachers should be able to answer every question that a student throws in. Professional development programs will allow teachers to expand their knowledge base in various areas of the subject. The more the professional development a teacher undergoes, the more he or she develops knowledge and insight into the industry.

Teachers Want to Pursue Their Education

Teachers find it easy to get burdened with the grind of teaching. Professional development for teachers gives them a chance to step out of their routine— they become the student rather than the teacher. It keeps educators motivated as they know they get the professional assistance they need to be better teachers. It keeps educators motivated as they know they get the professional support they need to be better teachers. After all, professional development nurtures the skills of teachers willing to take on

leadership positions in education, and teachers need to learn from other experienced leaders to become effective leaders themselves in the future.

Check Your Progress
Notes: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of the unit.

1. What are the Limitations of ICT in Teaching……………………………………………………………
……………………………………………………………………………
……………………………………………………………………………

2.Define World Wide Web
……………………………………………………………………………
……………………………………………………………………………
……………………………………………………………………………

9.7 LET US SUM UP

In this unit you have learnt the concept of Information and Communication Technologies in Education

9.8 UNIT- END- EXERCISES

1.Define the Advantages in ICT in Education

9.10 ANSWER TO CHECK YOUR PROGRESS

- Actually, you can achieve the latest knowledge.
- If you study with ICT then there is a big open scope for developing the entire sector.
- In business, you can analyze and read reviews of the customer.
- Demands of products can be statistically measured through ICT.
- You can keep knowledge about your competitor products and services.

9.11 SUGGESTED READINGS

1.Adam, D.M.(1985). Computers and Teacher Training; A Practical Guide. New York: The Haworth Press Inc.
2.Behera, S.C.(1991). Educational Television Programmes. New Delhi: Deep and Deep Publications.
3.Das, R.C.(1993)Educational Technology; A basic Text. New Delhi: Sterling Publishers Private Limited.
4. Kumar, N. & Chandiram, J.(1967). Educational Television in India. New Delhi: Arya Book Depot Patel, I.J. et al. Handbook of Programmed Learning, CASE Baroda.

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UNIT X ICT FOR TEACHING LEARNING

Structure

10.1 INFORMATION AND COMMUNICATION TECHNOLOGY(ICT)

Information and communication technology is defined as the use of hardware and software for efficient management of information. i.e. storage, retrieval, processing, communication, diffusion and sharing of information for social, economical and cultural upliftment. Information and communication technology (ICT) is defined as the implementation of different branches of technology in information and communication processing. In a broader sense, ICT is taken to refer to the whole set of enabling technology concerned with communication, manipulation of information (hardware and software), networking, data storage, transmission –encompassing data ,voice and video.

In this study we did not measure differences in learning achievements between more or less appreciated tools. However, students reported that they learned more when working with the tool they appreciated most. In general, students stated that all parts of the questionnaire were important in the appreciation of ICT tools, albeit of varying importance. From the list of most important indicators of why students appreciate an ICT tool or not, we conclude that students appreciate applications with an interesting and attractive content and interface. They like to work with clearly designed tools with instructions that are easy to understand. Further, students appreciate to work in an exploratory and cooperative way with the opportunity to try things for themselves and consult their fellow students. On the other hand, the tool must be self-explanatory or thoroughly explained by the teacher and mistakes should be immediately noticeable.

In this study we did not measure differences in learning achievements between more or less appreciated tools. However, students reported that they learned more when working with the tool they appreciated most. In general, students stated that all parts of the questionnaire were important in the appreciation of ICT tools, albeit of varying importance. From the list of most important indicators of why students appreciate an ICT tool or not, we conclude that students appreciate applications with an interesting and attractive content and interface. They like to work with clearly designed tools with instructions that are easy to understand.

10.2 Appreciate the potential of ICT in Education

Some teachers appreciate the beauty of technology and its effectiveness in teaching over traditional teaching and show positive attitude whereas some other teachers show negative attitude and are reluctant to use technology. The attitudes of teachers, vary significantly towards technology.
Resistance to change: Generally teachers do not cooperate or show positive view on new issues in curriculum or practices as it needs, efforts and also a question of status quo, as teachers' willingness to learn from others have difficulty. They feel the technological experiments are beyond their purview and scope of job and resist such change.
Challenge of new models of teaching: New models are creating unprecedented challenges to traditional models of schooling. The various online and open courses of studyat higher education are widely used as they are very popular and the distance learning and new models are used by the regular and traditionalpractitioners.

Providing adequate technology access: Due to a lack of funds and attitudes, there is no access in terms of environment and suitable hands on experience to students. They are not able to equip themselves or cope with the new developments or use new technology. If we can provide access to all the students in their purview wave, then they can create a space to overcome the challenge of accessing technology.

Technical support for technology use and maintenance: It is very important that teachers need to be strengthened in using technology by handholding help where anxieties and other problems are encountered. But when teacher encounter technical problems, they need technical support at that time. Sometimes when a teacher is using technology in the classroom and if suddenly technology fails the whole planning and completing that task would suffer like the file does not open, projector fails, system fails etc.

10.2.1 Specifically in teaching and learning

Teaching and learning with the help of indoctrinated principles and laws of modern psychology, sociology, engineering, administrative theory, mathematics and other social and physical sciences. It develops educational efficiency by formulating and remodeling according to the needs. Also, it plays its important role not only in the classrooms but also in the entire school environment, educational administration and educational references. Globalization is powered in part by tremendous and rapid ICT advances, and young people are often among the first to take advantage of new developments in this area. After reading this unit, you will get the tremendous ideas of Educational Technology, Information and Communication Technology.

10.3 Releasing the importance of learner analysis and classroom analysis

classroom where a structured discussion raises basic issues, probes beneath the surface of things and pursues problematic area of thought. Curriculum development Teacher need coaching on how to develop an appropriate, effective curriculum that enables students to conduct meaning, develop new knowledge, and communicate understanding.

Full integration of technology into curriculum: Teachers need strategies to meaningfully integrated technology into the curriculum. Technology must be considered as a learning tool and not merely treated as subject area in itself. In particular, teachers need long- term skills and strategies for using technology to support their curriculum, student outcomes, and student learning goals.

Staff Development: Activities that simply provide skills in using particular software applications, for instance, have shown little impact on students' classroom learning. Ultimate student success depends on teachers using technology to support sophisticated, hands-on/ minds-on multidisciplinary learning projects. These projects must be tightly linked to overall strategic goals and to contents and standards.

Therefore, teachers need a system of support at various level for integrating technolvb cogy and overcoming their isolation as they struggle with new and unfamiliar approaches to teaching and tools for learning. They also need real-time technical support in resolving problems related to hardware, software, and computer networks; problems that often interfere with or even derail the learning of both teachers and students.

With the advance of information and communication technology (ICT), people's everyday life, including education as its integral part, has been in a process of dramatic change. Numerous studies have indicated that ICT can improve education outcomes (Barak & Watted & Haick, 2016; Wang & Teng & Chen, 2015; Barrs, 2012; Blattner & Fiori, 2009). The impact of ICT on education can be manifested by the changes related to the teaching form, teaching environment, teaching content and teacher-student interaction, which greatly facilitate teaching and learning. Consequently, government and educational authorities from all over the world have invested a large amount of money into educational settings in the form of ICT aiming to transform traditional teaching. However, we have found out that in many schools and universities, classroom teaching is still dominated by traditional education characterized by textbooks, blackboards, chalk, and talk, as most teachers still do not use computer technologies in classroom teaching. Therefore, it is necessary to discuss the factors influencing this phenomenon so that the substantial funds allocated to education would be used efficiently.

Although there exists a general consensus on the existence of various kinds of factors leading to this phenomenon, the authors of this paper hold the view that teachers' attitude towards ICT is the main factor affecting the infusion of ICT into instructional practice since, on the one hand, the teacher is the direct implementer of ICT and must play an important role in combining ICT and education. If teachers' attitude towards ICT is negative, or put in other words, if teachers refuse to use ICT in classroom teaching, the integration of ICT in classroom teaching will come to naught, i.e. simple introducing of ICT does not guarantee its integration into the educational setting; on the other hand, teachers' attitudes towards ICT will, to a considerable extent, influence students' attitudes towards ICT.

Therefore, this paper will discuss the integration of ICT in the educational setting from the perspective of teachers' attitudes.

Based on this, the paper will analyze the factors that can affect teachers' attitudes towards ICT. We divide the factors into two groups: extrinsic factors and intrinsic factors. The intrinsic factors are the so-called uncontrollable factors, including age, gender, teaching experience, school location, grade level of teaching, computer experience, etc; the extrinsic, also called controllable factors, include computer competence, computer training, computer anxiety, school or administration support, teachers' theory of teaching, etc. By doing so, this paper aims to provide some insights for educators and educational policy-makers on how to construct strategies for minimizing the ill effects of ICT.

10.4 Analyzing curriculum to identify areas for ICT infusion

The curriculum therefore is rolled out as a series of short courses, spanning the six strands and ensuring together the basic, intermediate and advanced levels of competence. Three induction and twenty refresher courses leading to a diploma in ICT in Education is proposed. Induction courses are to be conducted in face to face mode whereas State (SCERTs/ SIEs) may chose to conduct the refreshers in face to face or in online mode.

10.5 Determining the ICT resources for teaching-learning

The rapid growth in ICT has brought remarkable changes in the twenty-first century, as well as affected its adoption and integration by teachers in teaching-learning process. The effective integration of technology into classroom practices poses a challenge to teachers and administrators. For successful integration of ICT into teaching-learning process, it can be concluded that the factors that positively influenced teachers and administrators, use of ICT in education include teachers¾ attitudes, ICT competence, computer self-efficacy, teaching experience, education level, professional development, accessibility, technical support, leadership support, pressure to use technology, government policy on ICT literacy, and technological characteristics. However, the presence of all factors increases the probability of excellent integration of ICT in teaching-learning process. Therefore, the training of teachers in the pedagogical issues should be increased if teachers are to be convinced of the value of using ICT in their teaching-learning process.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the importance of learner

……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

2.Define curriculum to identify areas for ICT infusion

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……………………………………………………………………………

……………………………………………………………………………

10.6 LET US SUM UP

In this unit you have learnt the concept of ICT for teaching learning

10.7 UNIT- END- EXERCISES

1.Define Appreciate the potential of ICT in Education

10.8 ANSWER TO CHECK YOUR PROGRESS

Some teachers appreciate the beauty of technology and its effectiveness in teaching over traditional teaching and show positive attitude whereas some other teachers show negative attitude and are reluctant to use technology. The attitudes of teachers, vary significantly towards technology.

Resistance to change: Generally teachers do not cooperate or show positive view on new issues in curriculum or practices as it needs, efforts and also a question of status quo, as teachers' willingness to learn from others have difficulty. They feel the technological experiments are beyond their purview and scope of job and resist such change.

Challenge of new models of teaching: New models are creating unprecedented challenges to traditional models of schooling. The various online and open courses of studyat higher education are widely used as they are very popular and the distance learning and new models are used by the regular and traditionalpractitioners.

Providing adequate technology access: Due to a lack of funds and attitudes, there is no access in terms of environment and suitable hands on experience to students. They are not able to equip themselves or cope with the new developments or use new technology. If we can provide access to all the students in their purview wave, then they can create a space to overcome the challenge of accessing technology.

Technical support for technology use and maintenance: It is very important that teachers need to be strengthened in using technology by handholding help where anxieties and other problems are encountered. But when teacher encounter technical problems, they need technical support at that time. Sometimes when a teacher is using technology in the classroom and if suddenly technology fails the whole planning and completing that task would suffer like the file does not open, projector fails, system fails etc

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6. Ray, P.K.S (2012). Technology of Instructional Design, Part II. Delhi: Dominant Publishers and Distributers

UNIT XI INTERNET

Structure

11.1 INTRODUCTION

Internet is not only an access to websites, these days there is knowledge and information on every aspect of the educational world over the Internet. The resources provided on various web pages are indeed very informative and useful for professionals and students related to every field of work. The only pre-requisite is the research over the Internet for a specific educational topic, and then this information just needs to be filtered to gain the basic knowledge of what you are looking for. Therefore, these are true internet resources which deal with every individual's educational needs. Internet has also provided the opportunity to study online in the context of e-learning, m-learning and virtual learning. There are virtual universities set up, in which the students can take classes siting on the computer seat opening the university's website video section according the topic, and then study at home. This unit creates an opportunity to the learners to learn the concept of Internet and its educational uses.

Internet, E-mail, Search Engines, Info-Savvy Skills, Digital Age Skills, Safe Surfing Mode and Internet resources for different disciplines like natural sciences, social sciences, Humanities, and Mathematics. And also this unit describes the concept of E-learning, Mobile-learning, On-line learning, Virtual classroom, Smart Classroom, Wikipedia, Massive Open Online Courses (MOOCs) and Social networking

LEARNING OUTCOMES

After going through this unit, you will be able to:

- explain the basics of Internet, E-mail and Search Engines

- discuss the concept of Info-Savvy Skills, Digital Age Skills and Safe Surfing
- identify and use the Internet resources for different disciplines
- describe the concept of e-learning: Mobile-learning and On-line learning
- explain the meaning of Virtual classroom and Smart Classroom,
- identify the uses of Wikipedia in education
- recognize the importance of Massive Open Online Courses(MOOCs)
- describe the educational uses of Social networking sites

11.2 Concept

Internet is the world's largest computer network, the network of networks, scattered all over the world. It was created nearly twenty-five years ago as a project for the U.S Department of Defense. The Internet is a global network of computers that allows many millions of computer users to share and exchange information. Internet is a rich source of information. Many thousands of computers are linked to the Internet, hold vast quantities of data that you can access from your personal computers whenever you want. Teachers, students, businessmen, doctors, engineers, scientist etc. can get recent data from internet which makes their knowledge up-to-date. Accessing the information through internet is much faster. Information can be downloaded into the computer and print out can be taken.

Origin and Development of the Internet

Network Types

A network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.

A network can be categorized by their size. A computer network is mainly of four types:

11.3 Network Types

LAN (Local Area Network)

PAN (Personal Area Network)

MAN (Metropolitan Area Network)

WAN (Wide Area Network)

11.3.1 LAN (Local Area Network)

Local Area Network is a group of computers connected to each other in a small area such as building, office.

LAN is used for connecting two or more personal computers through a communication medium such as twisted pair, coaxial cable, etc.

It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
The data is transferred at an extremely faster rate in Local Area Network.
Local Area Network provides higher security.
Computer Network Types

11.3.2 PAN (Personal Area Network)

Personal Area Network is a network arranged within an individual person, typically within a range of 10 meters.

Personal Area Network is used for connecting the computer devices of personal use is known as Personal Area Network.
Thomas Zimmerman was the first research scientist to bring the idea of the Personal Area Network.
Personal Area Network covers an area of 30 feet.
Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

Computer Network Types

There are two types of Personal Area Network:

Computer Network Types
Wired Personal Area Network
Wireless Personal Area Network
Wireless Personal Area Network: Wireless Personal Area Network is developed by simply using wireless technologies such as WiFi, Bluetooth. It is a low range network.

Wired Personal Area Network: Wired Personal Area Network is created by using the USB.

Examples of Personal Area Network:

Body Area Network:

Body Area Network is a network that moves with a person. For example, a mobile network moves with a person. Suppose a person establishes a network connection and then creates a connection with another device to share the information.

Offline Network:
An offline network can be created inside the home, so it is also known as a home network. A home network is designed to integrate the devices such as printers, computer, television but they are not connected to the internet.
Small Home Office: It is used to connect a variety of devices to the internet and to a corporate network using a VPN

11.3.3 MAN(Metropolitan Area Network)

A metropolitan area network is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network.

Government agencies use MAN to connect to the citizens and private industries.
In MAN, various LANs are connected to each other through a telephone exchange line.
The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
It has a higher range than Local Area Network(LAN).
MAN is used in communication between the banks in a city.
It can be used in an Airline Reservation.
It can be used in a college within a city.
It can also be used for communication in the military.

11.3.4 WAN (Wide Area Network)

A Wide Area Network is a network that extends over a large geographical area such as states or countries.

A Wide Area Network is quite bigger network than the LAN.
A Wide Area Network is not limited to a single location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.
The internet is one of the biggest WAN in the world.
A Wide Area Network is widely used in the field of Business, government, and education.

Computer Network Types

Examples of Wide Area Network:

Mobile Broadband: A 4G network is widely used across a region or country.
Last mile: A telecom company is used to provide the internet services to the customers in hundreds of cities by connecting their home with fiber.
Private network: A bank provides a private network that connects the 44 offices. This network is made by using the telephone leased line provided by the telecom company.

Advantages of Wide Area Network

Following are the advantages of the Wide Area Network:

Geographical area: A Wide Area Network provides a large geographical area. Suppose if the branch of our office is in a different city then we can connect with them through WAN. The internet provides a leased line through which we can connect with another branch.
Centralized data: In case of WAN network, data is centralized. Therefore, we do not need to buy the emails, files or back up servers.
Get updated files: Software companies work on the live server. Therefore, the programmers get the updated files within seconds.
Exchange messages: In a WAN network, messages are transmitted fast. The web application like Facebook, Whatsapp, Skype allows you to communicate with friends.
Sharing of software and resources: In WAN network, we can share the software and other resources like a hard drive, RAM.
Global business: We can do the business over the internet globally.

High bandwidth: If we use the leased lines for our company then this gives the high bandwidth. The high bandwidth increases the data transfer rate which in turn increases the productivity of our company.

Disadvantages of Wide Area Network:

The following are the disadvantages of the Wide Area Network:

Security issue: A WAN network has more security issues as compared to LAN and MAN network as all the technologies are combined together that creates the security problem.

Needs Firewall & antivirus software: The data is transferred on the internet which can be changed or hacked by the hackers, so the firewall needs to be used. Some people can inject the virus in our system so antivirus is needed to protect from such a virus.

High Setup cost: An installation cost of the WAN network is high as it involves the purchasing of routers, switches.

Troubleshooting problems: It covers a large area so fixing the problem is difficult.

Internetwork

An internetwork is defined as two or more computer network LANs or WAN or computer network segments are connected using devices, and they are configured by a local addressing scheme. This process is known as internetworking.

An interconnection between public, private, commercial, industrial, or government computer networks can also be defined as internetworking.

An internetworking uses the internet protocol.

The reference model used for internetworking is Open System Interconnection (OSI).

Types of Internetwork:

1. Extranet: An extranet is a communication network based on the internet protocol such as Transmission Control protocol and internet protocol. It is used for information sharing. The access to the extranet is restricted to only those users who have login credentials. An extranet is the lowest level of internetworking. It can be categorized as MAN, WAN or other computer networks. An extranet cannot have a single LAN, atleast it must have one connection to the external network.

2. Intranet: An intranet is a private network based on the internet protocol such as Transmission Control protocol and internet protocol. An intranet belongs to an organization which is only accessible by the organization's employee or members. The main aim of the intranet is to share the information and resources among the organization employees. An intranet provides the facility to work in groups and for teleconferences.

Intranet advantages:

Communication: It provides a cheap and easy communication. An employee of the organization can communicate with another employee through email, chat.

Time-saving: Information on the intranet is shared in real time, so it is time-saving.

Collaboration: Collaboration is one of the most important advantage of the intranet. The information is distributed among the employees of the organization and can only be accessed by the authorized user.

Platform independency: It is a neutral architecture as the computer can be connected to another device with different architecture.
Cost effective: People can see the data and documents by using the browser and distributes the duplicate copies over the intranet. This leads to a reduction in the cost.

11.4 Internet and internet tools

The Internet is a vast place, and the amount of information potentially available is hard to imagine. More difficult still is conceptualizing how it all works and how one can access this wealth of resources. Fortunately, tools exist to assist in Internet navigation, and what could be a truly daunting undertaking has been facilitated by a number of applications and protocols. This chapter aims to define briefly some of the various tools Internet users can employ to make their way around the Internet, extract useful information, and in general turn it into a useful and user-friendly commodity for them. The projects described in this book make use of all sorts of Internet applications and mechanisms, and it behooves the foreign language (FL) teacher reading this volume to understand the protocols that make such projects possible. Having a better understanding of how the Internet works and how various programs can be used for specific FL teaching purposes will enable FL educators to venture confidently into the net and make it an extension of their classroom. It will enhance their ability to conceive Internet-based projects and to solve the inevitable problems that appear. To that end, this chapter will discuss electronic mail (e-mail), Gopher, FTP, Telnet, Usenet groups, LISTSERV lists, and the World Wide Web (WWW), with particular attention to relevance for FL teachers. Suggestions will also be made for where and how to find materials that are germane to the goal of enhanced FL education.

E-mail

The most common method of using the Internet is e-mail. If you are reading this book, you probably have e-mail access of one form or another. If you do not, it is highly likely that you will run out and get it after you finish reading about all of the wonderful projects you can do via e-mail and other electronic communications connections to the Internet. E-mail is precisely what its name implies: an "electronic post." To use e-mail, you must have an access (preferably local to minimize phone charges) to the Internet, which can be provided by numerous means. Many FL educators have e-mail access through their home institution. Such accounts are often assumed to be "free," but make no mistake: somewhere, someone is paying for the Internet connection. Other possibilities for access include freenet or communitynet systems, which function much like public broadcasting stations dependent on listener donations for survival, and a plethora of commercial enterprises offering Internet access among their commodities (e.g., CompuServe, AOL, Prodigy). E-mail access also necessitates software to enable your computer to talk to the host computer, ensuring that you can issue commands, receive mail, and generally function in the e-mail program. Many e-mail software programs exist, and each has its own system of commands and operations. You need to check with your local e-mail service provider to obtain instructions that are specific to your particular system.

General e-mail functions include: sending and receiving new mail, saving mail to a file system, replying to a message received, including parts of

previously received messages in responses, and forwarding mail. Because the commands for these functions are different in each software program, you need to pay close attention to how your own system functions. For example, in some e-mail programs, hitting the "r" key causes a reply message to be sent to the sender of the message. That may be fine if you think you are replying to a message or posting from an individual. However, if the message came from a discussion list (see below) and was merely "signed" by the individual, your "reply" action could cause your response to go out to a list of hundreds of other subscribers instead of just that one individual. The potential for embarrassment is obvious; hence, it is wise to learn the mechanics of your e-mail system and exercise caution in carrying out commands. If you do make a mistake along these lines, rest assured that you are one in a long, long line of Internet users who have done the same thing. Laugh at it, learn from it, and carry on.

E-mail is becoming so common that it will soon be as essential as the real postal service and the telephone. Indeed, people now routinely ask you for your "e-mail address" in addition to or instead of your postal address and phone number. In fact, it has been suggested that because of the Internet ". . . your telephone is superfluous" (Krohl, 91). Tell that to the adolescents you teach! Typically, an e-mail address includes some semblance of the user name, the symbol @, and a domain name indicating where the user's access origin is (e.g., ponterior@snycorva.cortland.edu). The information to the left of the "@" pertains to the user (here, Robert Ponterio); the information to the right is the address of the host computer system (in this case, SUNY/Cortland) and generally gives an indication of the nature of the access site. For example, .edu signifies an educational site, while .com represents a commercial provider. Countries other than the United States have their own tags at the end of e-mail addresses that are generally recognizable abbreviations (e.g., Canada=CA; Ecuador=EU; France=FR; Germany=DE; Switzerland=CH, and so forth).

Because e-mail is an international phenomenon, people all over the world are using it to communicate. A few problems that are peculiar to FL educators should immediately come to mind as a result. People using e-mail will want to communicate in their own language, and FL teachers will want to tap into this potentially rich source of target language dialogue and authentic materials. One problem, of course, is the transmission of accents for languages with Roman character sets. The normal 7-bit data path used for English and the ASCII character set does not provide for accents. In fact, when people attempt to put them in, the result can be quite displeasing (e.g., il a r=E9clam=E9 le retour des pi=E8ces d=E9tach=E9es =E0 Caen). An 8-bit data path, which basically doubles the number of characters available, does allow for accents and, while not yet entirely standardized, does provide most of the characters needed for typing French, German, and Spanish.

Unfortunately, most e-mail programs do not easily manage these 8-bit character sets yet, but with more and more users demanding this service, improvement in this area should be forthcoming. In the meantime, one solution is a standard called MIME (Multipurpose Internet Mail Extensions), which employs a 7-bit coded format for 8-bit character sets (known as Quoted-Printable). Similar encoding schemes are available to assist in the transmission of non-Roman character sets such as those needed for Arabic, Greek, Hebrew,

Japanese, or Russian. FL teachers with MIME compatible software can send and receive these character sets even if their particular e-mail system does not support an 8-bit data path. In addition, a 16-bit Unicode standard exists that allows the representation of all the world's written languages in its 65,536 symbols. This standard is already being employed by corporations that do international business, and it will become more common if FL teachers (who also "do international business") demand it from their service providers.

Mailing Lists (LISTSERV)

Mailing lists are discussion groups on the Internet established for people with common interests. These lists are frequently referred to as LISTSERV lists, although LISTSERV refers to a particular type of server. Other mail servers do exist, such as Listproc and Majordomo. (The commands used in the following section to describe various list functions are LISTSERV commands.) Lists are perhaps the most basic electronic communications resource accessed through e-mail, and many exist that have a FL focus. Undoubtedly, many of these FL lists are mentioned in connection with the projects detailed elsewhere in this volume. Some are discussion lists: FLTEACH (Foreign Language Teaching Forum) was founded expressly for professional communication, articulation, and professional development of FL educators, (see Chapter X). Among the many goals of FLTEACH is an increase in sharing information, ideas, and materials between and among FL educators (cf. LeLoup & Ponterio, 1994, 1995).

Other on-line forums can be categorized as service lists: The LLTI (Language Learning and Technology International) list distributes information about all aspects of the technology used in language teaching. Subscribers post information or questions about language labs, video, computer applications, and any technological questions related to language teaching. LLTI is also a forum where subscribers can discuss the value of products or new trends in the profession. The Intercultural E-Mail Classroom Connections (K-12) list (IECC) provides a service for those FL teachers seeking partner classrooms for international and cross-cultural electronic mail exchanges. It is not a list for discussion or for people seeking individual penpals.

Finally, language-specific lists are well-represented on the Internet. Literally hundreds of on-line discussion groups address particular foreign language interests, and they are as specific and diverse as their membership permits and supports. List topics range from the very general, where FL teachers of the same language converge and dialogue (e.g., EDUFRANCAIS@UNIV-RENNES1.FR--an international list where French teachers at all levels and in all countries can exchange cultural and linguistic information about France and other francophone countries; ESPAN-L@TAUNIVM.BITNET, a "lista para profesores de español"), to very singular and esoteric topics (e.g., MEDTEXTL@UIUCVMD, a discussion group dealing with "Medieval Text - Philology, Codicology, & Technology") to highly specialized lists focusing on uncommonly taught (at least in the United States!) languages (e.g., READER@TASHA.POLY.EDU, a discussion in English of Arabic [+ Farsi, Urdu, etc.] script on computer). Be cautioned that, while many of these lists appear to remain relatively stable over time, others may wane or undergo some sort of metamorphosis such as a change in name, address, or primary focus.

Joining and then participating on a list are relatively simple processes, and knowing a few rules will ensure successful and happy list membership. First, lists generally are associated with two addresses: one for posting and one for sending commands to LISTSERV to perform functions. For example, to subscribe to FLTEACH, you would send a command to

LISTSERV@LISTSERV.ACSU.BUFFALO.EDU

with the subscription command

SUBSCRIBE FLTEACH Robert Ponterio

Thereafter, to post to FLTEACH, you send your messages to

FLTEACH@LISTSERV.ACSU.BUFFALO.EDU

The LISTSERV address transmits commands to a computer, and the list address transmits messages to people. If you remember this essential difference, you will not experience any embarrassing moments such as the one referred to above in the section on e-mail or frustrating silence after asking a "computer" what it thinks about a certain textbook or if it has ever chaperoned a student group to the Amazon.

Lists come in "all shapes and sizes, " and some are busier than others. The number of daily messages varies greatly among lists and during different times of the year. A general rule of thumb to follow is to read your messages on a regular basis to avoid overflowing mailboxes, which generate error messages and cause much consternation in list owners/managers. Mailbox capacities vary from system to system, so be sure and check frequently on your own space allocation. Most lists offer options such as INDEX and DIGEST as alternative ways to receive daily postings and to assist in managing high volume list traffic. With INDEX, just the subject headings of messages are sent, and you can select those messages you wish to read and then send for them separately. With DIGEST, you receive one large message periodically from the list, containing all the postings therein. You can then download this message into your word processor and browse for those individual messages of interest specifically to you. When you are going to be away from your account for an extended period of time, it is wise to change your mail setting for high volume lists to NOMAIL to prevent mailbox clogging. Again, all of these commands should be sent to the LISTSERV address and not to the list.

Participation on lists can be active or "passive" and is usually a personal decision. You are generally free to "lurk" on a list, which means you read and perhaps pass along information that you have gleaned from the list to colleagues, or you may post as frequently as you choose. Some lists are moderated, which generally means that the list managers must approve all messages submitted. Some lists require that members meet certain criteria before permission to subscribe is granted. This regulation is generally an attempt to maintain the focus of the discussion, a move greatly appreciated by most list members. Upon subscribing to a list, members generally receive a welcome message with all sorts of information that appears superfluous at the time but that will be desperately needed later on (such as how to unsubscribe from the list and so forth). Save this message or you could ride forever 'neath the streets of Boston . . . .(Kingston Trio, 1962).

When and if you decide to enter the LISTSERV fray, you need to observe certain rules of netiquette. Some that have to do with mechanics have

already been mentioned above, namely being aware of where and to whom your message is headed. In addition, the considerate poster adheres to a few general standards regarding the tenor of messages and message content itself. First, please identify yourself at the end of your message, including your e-mail address. Many systems strip the headers from messages, and often people simply do not know the originator of a post nor their address and therefore cannot respond. Most systems have provisions for appending a signature file, which can contain necessary information for contacting a poster (e.g., name, e-mail and postal addresses, work affiliation, phone number). Some people personalize these with computer "drawings" or favorite quotes from famous people (or themselves). Secondly, remember that messages on the Internet can come across in an extremely impersonal manner. The typical body language, facial expressions, and other adjuncts that enrich our face to face conversations are totally absent in this environment. A phrase meant to be funny can easily be interpreted as sarcasm or an unnecessary jibe that was totally unintentional. Whenever possible, use emoticons or those smiley faces :-) to indicate where humor should be understood, for example, or the winking face ;-) to express irony, and be sensitive to the readers at the other end of your message.

Telnet

Not only can you reach other people on the Internet, you can also log into other computers. The tool for accomplishing this virtual feat is called Telnet. It is the Internet's remote login application and allows you to sit at your computer and login to any number of computers across the room, the campus, the country, or around the world. This one word (i.e., the application it represents) can give you access to libraries, newspapers, public programs, and many services that other computers offer to Internet surfers. It can also give you access to your home account when you are out of town if you can log into a local provider where you happen to be. This possibility can be very useful if you are subscribed to many lists and forgot to set yourself to NOMAIL during your absence. It can also allow you to stay in contact with colleagues in case you need last-minute information for presentations or any other reason. To find out if you have access to Telnet through your local service provider, type the word telnet at your command prompt. If you are using an icon-driven system, click on the Telnet icon. If you have a Telnet connection, the program will start up. Some programs offer a direct instant connection if you type telnet and the Telnet address all on the same line. If you do not have Telnet, you will probably get an error message, but you will not have broken your computer or the Internet.

Once you have established the availability of Telnet on your local system, you need only find Telnet addresses and then you can literally "go to town" or Katmandu or wherever you want, providing you have the Telnet address. These addresses look much like the righthand part of e-mail addresses, and they sometimes have a number at the end. This number indicates the port or particular computer or server on the system; the default port is 23 and is generally omitted. For example, the Telnet address for the home of FLTEACH is SNYCORVA.CORTLAND.EDU (default port).

Once you start up the Telnet program and are connected, you will usually see a screen message that indicates the escape character. Make sure

you make a note of this character so you can leave the remote system when you are finished with your Telnet session. A typical escape character is "CTRL-]" or carat-left bracket, but these sometimes change. Next, you will need to know the login and password of the server where you are attempting to connect. If you are headed to a public site, you will most likely have this information or it will be provided to you. If it is not and you do not know it, simply quit the Telnet session and go elsewhere or home. The "close" command is also handy when you want to disconnect from a remote system in the middle of a connection. When you are logged into a remote system, the commands pertain to that system and not yours. If you need assistance, type "help" to see what commands will work on that particular server.

Gopher

Gopher is a menu-driven application that allows you to browse all kinds of Internet resources. The analogy of a library card catalog has been used frequently to describe this tool (Crispen; Krohl). Essentially you go exploring "library" sites around the world and, when you find something interesting, you ask the Gopher to "go fer" it and bring it to your computer screen. The exploration and information transfer are possible because all of these menus or "libraries" are interconnected, making up a vast Gopherspace.

In order to venture into Gopherspace, a Gopher client running on the local system is necessary. The fastest way to find out if you have one is to type the word gopher at the command prompt. Again, in an icon-driven system, click on the Gopher icon. If a Gopher client is available and running, the program will start up. If you have a Gopher server at your local site, its home or root menu will most likely show up on the screen. If you do not have Gopher access, you will get an error message but once again, you will not have broken your computer or the Internet.

Now you can begin your exploration of Gophers all over the world. Each menu can potentially lead you further into that "library" or into another with an entirely different collection of resources. The menus operate in a hierarchical system of pathways to help you find your way back home. It is not necessary to leave breadcrumbs along the way--you merely type "u" for "up a menu" until you reach your destination. You can also "quit" the program entirely and exit. Some Gophers are text-based while others have graphical representation (icons) to lead the browser from menu to menu.

One nice feature of Gopher is the ability to make bookmarks once you have arrived at a location you think you would like to return to in the future. This capability provides a wonderful shortcut for the next time you want to go directly to, for example, the weather report in Ushuaia. To make a bookmark in most Gopher applications, you press a designated key and the current item is added to your bookmark list. Single items or an entire menu can be added. You can also delete bookmarks, view your bookmarks, and perform many other commands as well. Check with your local service provider for operation and command instructions because Gopher client programs are all different. Some are freeware and can be downloaded from Internet sites, some cost (either shareware--also "downloadable" or commercial products), but they all have the basic purpose of accessing Gopherspace.

Below is an example of the Gopher root menu for SUNY/Cortland:

Home Gopher server: gopher.cortland.edu

1. Welcome to SUNY Cortland's Gopher Server (1KB,01-Nov-1994)
2. New Items on this Gopher (764 Bytes,01-Nov-1994)
3. SUNY Budget Info (Help save SUNY!)/
4. Administrative Information/ -->
5. Academic Information/
6. SUNY Cortland Info/
7. News, Events, Sports and Calendars/
8. Library Resources/
9. Internet Services/
10. Computing Services/
11. Campus Life/
12. Cortland's WWW Home Page <HTML>
13. HELP!!!! /

Press ? for Help, q to Quit Page: 1/1

By using the arrow cursors to create a path (foreign languages (ICC)/ -> Language Electronic Resources/ -> Foreign Language Teaching Forum (FLTEACH)/) through the menu hierarchy, the trail eventually leads to the FLTEACH home menu:

Home Gopher server: gopher.cortland.edu

1. Foreign Language Teaching Forum
2. FLTEACH Welcome Message
3. Foreign Language Electronic Resources (collected at FLTEACH)/
4. Search FLTEACH Subscriber Biographies <?>
5. FLTEACH Subscriber Biographical Information
6. Foreign Language Methods Syllabi (collected at FLTEACH)/
7. FLTEACH World Wide Web Page <HTML>

-- Articles --

9. "'Networking' with Foreign Language Colleagues," LeLoup & Ponterio
10. Foreign Language related E-Lists collected by David Bedell
11. Electronic Pen Pals article by Adi Hofmann

-- FLTEACH Archives --

13. Search entire FLTEACH Archive <?>
14. Search ONLY messages sent THIS MONTH <?>
15. Listing of all FLTEACH messages for THIS MONTH/
16. Search ONLY messages sent in APRIL 1995 <?>
17. Listing of all FLTEACH messages for APRIL 1995/

-- FLTEACH Log Files --

Press ? for Help, q to Quit Page: 1/2

Various symbols appear at the end of menu items to indicate what these items denote. In a UNIX Gopher client, the slash mark (/) at the end of a menu item indicates a gateway or path to another menu (e.g., #3). When no more slashes appear, you are at the end of that path. It is possible to establish keyword search engines in Gopher menus as well, as illustrated by the <?>

symbol at the end of some menu items (e.g., #4). Selection of this item allows requests to be made to a data base for information. The marker <HTML> denotes a link to a WWW page item displayed using hypertext markup language (e.g., #7). The graphics that are generally associated with this platform are not visible through this Gopher server. Gopher items can also be used to launch a helper application to play a sound, display an image, or just save the file to disk.

FTP

FTP (File Transfer Protocol) and Telnet are two of the oldest Internet utilities, allowing two machines to communicate with each other. Whereas Telnet lets you log into an account at a remote location and interact as if you were there, FTP allows you to move files between accounts on different computers, wherever they might be, at home and at the office or even in different cities, as long as both computers have Internet addresses. It is rather like getting access to two disks between which you can copy files, only the disks are not on the same machine nor even necessarily in the same country. The requirements are an FTP server running on a remote machine and an FTP client running on your local machine. There are two major ways to use FTP. You can move files between computers on which you have accounts or you can get files from an anonymous FTP server. We will look at both of these features.

Suppose that you have an account at SUNY Cortland and another at the Sorbonne, where you are doing research for your latest book. There are important text files that you need to access in both accounts as well as charts in the form of image files, digital sound recordings of the Paris Metro for your World Wide Web Paris page, and a flyer in Russian using a Cyrillic font in a WordPerfect document. You can use Telnet to log into your USA account from Paris, but that does not let you copy the files. Instead, you can use FTP from the Sorbonne account to log into the Cortland account:

```
$ ftp snycorva.cortland.edu
220 snycorva FTP Server (Version 3.2) Ready.
Connected to SNYCORVA.CORTLAND.EDU.
Name (SNYCORVA.CORTLAND.EDU:ponterior): ponterior
331 Username PONTERIOR requires a Password.
Password: Germaine
230 User logged in.
FTP>
```

When it is typed in, the password will not appear on the computer screen. The FTP client program on the computer in Paris has contacted the FTP server on the computer in Cortland allowing these two programs to connect the two accounts, the local one in Paris and the remote one in Cortland, in order to move files between them. To see what files are available on the remote machine in Cortland, type:

```
FTP> dir
```

This command will give you a listing of the current directory on the remote machine. To change to another directory on that machine, type:

FTP> cd new-directory-name

To move a file named "note.txt" from the remote machine in Cortland to the local machine in Paris, you first need to be sure that the file is located in the current directory on the remote computer. If it is not, then you must change the directory until you find the right file. The GET command is used to actually move the file:

FTP> get note.txt

Once the text has been transferred from the remote machine, a copy will be found in the current directory on the local machine. If you were sending a file in the other direction, from your local computer to the remote one, the command would be:

FTP> put note.txt

This process is fine for most text files sent on similar systems, but FTP has two modes that should be used to be sure that the file will be transferred in usable form. "ASCII" mode works for text files, and "binary" mode is required for anything other than simple text, i.e. computer programs, images, sounds, and even word processed document. The reason for using the ASCII mode is that text can be coded a bit differently on various computer systems. This is especially true of the extended characters used for accent marks. For most simple text files, FTP will try to make the characters look right on the receiving machine. The "note.txt" file had been created using a very simple text editor like the ones used by e-mail programs, so we were able to use ASCII mode by sending the command:

FTP> ascii

It is important to set the mode for ASCII or binary before beginning the file transfer. Binary mode does not bother about any kind of character set translation. In fact, it makes an exact copy of all of the codes in a file, no matter what they are. This is essential for any file in which there are bytes of data that do not represent text characters. Deciding which is best might be confusing in cases where a text has been typed in a word processor. Many word processors use special codes to keep track of information about fonts, margins, special character sets, and a host of other kinds of information about the text. These files are considered binary, and trying to transfer them using FTP in ASCII mode simply will not work. When in doubt about which mode to use, you can always try one and see if it works. In order to move the chart that is in an image file such as GIF or JPG, we first need to set the FTP mode to binary with the command:

FTP> binary

A sound file such as SND, AU, VOC, IFF, WAV or a moving picture file such as Quicktime or MPEG also must be sent as binary files. What about the Cyrillic text created in WordPerfect? Most text that has the format of a word processor document is really a binary file, so it also must use binary mode. There are some exceptions to this but not many. This word processing format

can be a sure way to transfer texts that use non-Roman character sets. If you need to move a large word processor generated file but are not sure which format will work, do a test on a small file first, just to make sure that binary mode is what you need.

Many people on the Internet have decided to make files available to anyone who might wish to get them. For example, someone might write a computer program for practicing verb conjugation and decide to give copies to anyone who wants one. To do this, she would set up a special FTP account that anyone can use. Since the account would not belong to anyone in particular, the log-in name will be "anonymous." No password is needed either, but by convention people type in their e-mail address in place of the password to let the host know who they are. Logging into the anonymous FTP site at the University of North Carolina goes something like this:

```
$ ftp sunsite.unc.edu 220 calypso-2.oit.unc.edu FTP server (Version
wu-2.4(39) Tue May 16 01:34:21 EDT 1995) ready.
Connected to SUNSITE.UNC.EDU.
Name (SUNSITE.UNC.EDU:ponterior): anonymous
331 Guest login ok, send your complete e-mail address as password.
Password: ponterior@snycova.cortland.edu
230- WELCOME to UNC and SUN's anonymous ftp server
```

Of course, you will not see your e-mail address when you type it in the place of the password because passwords do not appear on the screen. Anonymous FTP sites generally accept a limited number of users at one time, so getting into a popular site at peak hours can be difficult. If there are too many anonymous users, the FTP server will let you know. Once you have logged into the anonymous FTP site, you can use the DIR, CD, ASCII, BINARY, and GET commands to find and obtain anything there. Be sure to QUIT when you are ready to leave. Some FTP programs, especially on graphical systems like Macintosh and Windows, can be easier to use than command driven systems. You might see a directory listing for each computer on the screen and simply click on the commands that you wish to execute for changing directories, setting the mode, viewing, and moving.

Many files that are found on anonymous FTP sites are stored and transferred in compressed format. MS-DOS or Windows files often use ZIP while Macintosh uses STUFFIT. If you plan to get files via anonymous FTP, find out about the kinds of files that are used on your system and obtain the decompression software that you will need. You might even be able to use a World Wide Web browser instead of an FTP utility for access to anonymous FTP servers.

World Wide Web

The World Wide Web (WWW, W3, the Web) is perhaps the most exciting Internet application in use today because of its power, flexibility, ease of use, and widening access among the general public. A Web browser brings hundreds of thousands of sites around the world within your grasp in an instant. The ability to simultaneously present multiple media, text, images, sounds, moving pictures and to interact with the user to perform functions gives a Web page a power beyond other single medium applications. In a

discipline that recognizes the importance of context in communication, the mutual support of the various components of this multi-media tool provide a clear advantage in facilitating the comprehension of authentic texts. The flexibility of a Web page is amplified through the use of Hypertext Markup Language (HTML) to control the graphical formatting of page elements to a degree unparalleled in other utilities. For example, though even the inclusion of French accents can still be problematic for some recipients of e-mail, the use of diacritical marks is standard procedure on the Web, where even the non-Roman character sets of Russian and Japanese have been in use for some time. Unlike some other applications that require the use of a command language, the operation of a Web browser is entirely intuitive. If you can point to something, you can retrieve it.

Retrieving a WWW page requires a browser and an Internet connection. If you can use applications like Telnet and Gopher, then the machine on which they are running has an Internet connection. If you are connected to a network via an ethernet connection, a PPP, or a SLIP connection, then the network most likely has an Internet connection, and you can probably run a WWW browser because your machine can send and receive TCP/IP, Internet data. If your own computer's connection to the network is limited to the equivalent of a VT100 terminal, then you probably cannot run a Web browser. Finally, speed is a concern. Below 14400 baud, a graphical WWW connection seems to be crawling because images and sounds create large files that can take some time to arrive. Finally, if your Internet connection does not permit graphical access to the WWW, it might be possible to run a text only browser like LYNX. That will display the text without any pictures or sounds. To find out more about the kind of connection you have, ask your local experts.

Many WWW client programs, also called browsers, are available both commercially and freely. Mosaic is a free browser, and Netscape is free to educators. Many Internet service providers furnish a browser as a part of the service. These browsers perform the same basic functions and essentially behave in similar ways. Like many other Internet tools, the Web is based on a client-server application. A WWW server is a computer program that is connected to the Internet and has the ability to send files from its hard drive to other computers on the network. To communicate with a server, your computer needs a WWW client that can send requests for data to the server. Since both machines have an Internet address, the messages that they send can find their destination. The most important message that a client sends to a server is a request for a file.

WWW pages are sent using Hypertext Transfer Protocol (HTTP). This tells the client that the file being received is formatted in HTML, the Web standard. Other protocols exist for other utilities such as Gopher and FTP. A WWW browser begins by sending a request in the form of a Uniform Reference Locator (URL) . A URL is an address that specifies a type of file, a host machine and the location of the file on the machine.

http://web.cortland.edu/flteach/flteach.html

The first series of characters ending with a colon tells us that this file is a hypertext file. The name of the machine on which it is located, www.cortland.edu, can be found after the double slash. Following the next single slash we find the name of the directory, flteach; and finally, though not

always, the file name is FLTEACH.HTML. The HTML indicates that this is a document with HTML formatting tags that can be interpreted by the browser. In addition to the text and formatting information in the HTML document, a document may contain other URLs that refer to other types of data, e.g. images and sounds, to complete the WWW page. Because the browser is configured for the computer on which it is running, it is able to display all of the elements of the WWW page in the best possible way for that particular machine. For example, the screen resolution, available colors, and the presence of special hardware for sound or video will determine what sort of display is possible. Thus the final appearance of a WWW page depends both on the formatting that is written into it and on the configuration of the browser.

Improvements in the abilities of a browser can often be obtained through the use of helper applications. Programs that are better able to display the images, sounds, or motion pictures in a page can take over the job from the browser when needed. The selection of helper applications is up to the individual user, and many different ones are available and are interchangeable.

Hypertext is not linear. It contains pointers that link one location to another. These links can be found within the same document or in other documents, on the same server or on any server connected to the network. The Internet defines a virtual space in which a link can refer to WWW documents on servers anywhere in the world. The links in a document are references to URLs. They are highlighted so the user can recognize them as links, and when a link is selected, the browser sends a request for a new document to the server in the URL contained in the link. When the new page arrives, it replaces the old one. Browsers make it easy not only to follow a link but to retrace your steps back from a link to the original document. With millions of possible links on the network, it is essential to keep track of interesting discoveries. Bookmarks allow a user to save the URLs for interesting sites so that they can be easily found again when needed. This flattens out the Web by producing a personal hotlist of sites that you might wish to find again.

Besides the nicely formatted, multi-media presentation of HTML documents, a Web browser can also display the files associated with other types of URLs. The ability to function as a Gopher and an FTP client, in addition to being a hypertext client, makes a the WWW the most versatile of the Internet tools. By integrating these other functions, this utility can greatly simplify navigation on the Internet.

Interactivity in a Web page is accomplished through something called forms submission. A form is an area on a page displayed by a WWW client in which the user can type information that will be sent back to the WWW server. What the server does with this information is determined by the developer of the page. The information could be stored, processed in some way, forwarded to someone, used to look up additional information or even to control a physical device. Almost anything that a computer is able to do can be done with information submitted in a form. A typed phrase could be converted into synthesized speech and returned to the user as a sound file; data could be collected about the page topic and later used for research purposes; a keyword could be used to look up an encyclopedia entry or photo archive that could then

be sent to the user; a keyboard entry from a client could control a robotic camera whose output would then be sent back by the user as a part of the WWW page. A favorite use of the Web by graduate students is to connect a soda machine to the Internet and use a WWW page to find out if the machine has soda without having to walk down the hall. Believe it or not, there are quite a few soda machines on the Internet! The possibilities are limited only by imagination. As this volume suggests, FL teachers can certainly be as imaginative as thirsty graduate students.

USENET

USENET newsgroups are a popular way of participating in on-line discussions. The thousands of newsgroups can represent both advantages and disadvantages compared to e-mail discussion lists. Access to USENET is managed by a news reader. This application allows the user to select a number of groups and to routinely read new messages that have been posted to those groups. It does this by keeping track of the what the user has already read. The news reader can present messages in a particular group by topic, allowing the reader to easily follow the thread of a particular conversation or to delete the entire thread by marking it as "read." Messages from USENET do not fill the user's computer file space. A single copy of USENET groups can serve all of the users on a computer system and even those on other systems. All the information that needs to be saved in the individual's account is whether individual messages have been read or not. In some ways this is much more economical than distributing and storing multiple copies of e-mail postings.

On the down side, USENET news groups tend to be less focused than serious academic discussion lists. Less effort is involved in participating and it is easier to ignore a discussion, drifting in and out of the group. Anyone can join in a discussion at any time, and just about anyone does. This often leads to less commitment to the group as a community, resulting in a less collegial, less supportive conversational tone. Quite a bit of variety exists in this area in both e-mail discussion lists and USENET newsgroups, so generalizations can be dangerous. Wonderful discussions and terrible arguments can take place in both lists and newsgroups.

Because of the lower cost of overhead, newsgroups can be an easy way for students to get involved in conversations in the target language (TL) with peers in other schools or around the world. Groups targeted specifically towards the support of K-12 foreign language instruction such as:

k12.lang.deutsch-eng
k12.lang.esp-eng
k12.lang.francais
k12.lang.russian

permit students to make contacts that they can then pursue either in the group or in e-mail exchanges on their own. These are moderated to the extent that a teacher watches the postings to encourage use of the TL and to watch out for any other problems that might develop. Other groups serve as a forum for discussion of a target language culture. Here discussion tends to range from encouraging support of foreigners interested in the group's topic to nasty arguments about cultural differences. These groups can be interesting and even quite useful in their own way.

soc.culture.african
soc.culture.celtic
soc.culture.europe
soc.culture.french
soc.culture.italian
soc.culture.latin-america
soc.culture.mexican
soc.culture.spain
talk.politics.soviet

The language is far more authentic than that found in the K-12 groups. Nevertheless, we would hesitate to recommend them to students without careful supervision. Of course this can be true of many areas of the Internet where items can be found that might be inappropriate for an age group. Empowering students by giving them control of their access to information can lead to this potential problem no matter what medium carries the information. A well informed teaching and library staff that can supervise the students is an important element in developing appropriate uses of this technology.

Less Common Tools

A few tools are less commonly used because they require a huge amount of electronic resources or they are black holes that will eat up far too much time. IRC (Internet Relay Chat) is a very popular program that presents a series of "channels" rather like a CB. By entering a channel, you can "talk" to all of the other people on the channel, no matter where they are in the world. Everything that you type will be seen instantly by all of the other people there, and you will see anything that they type. Channel names usually reflect the topics discussed, so entering a channel called "français" might be interesting for a French class, especially if you have made an appointment to meet some other Francophones there at a specific time. A quick look at the list of topics in IRC might convince you that it is not a good place to leave students unsupervised, but IRC does have a great potential for worldwide, interactive communication. IRC is just a tool whose value will depend on whether you can find a specific application that will serve your teaching objectives.

MUDs (Multi-User Dimensions), MOOs (MUD Object-Oriented), and MUSHes (Multi-User Shared Hallucinations) are primarily used for role playing games. A player who enters one of these "places" takes a nickname and then proceeds to interact with the other people there according to rules that can be quite different at each site. Many of these represent fantasy scenarios taken from popular fiction, especially science fiction. Some resemble Dungeons and Dragons. A group of language MOOs have been established where students can interact in the target language. The students themselves create a virtual environment incorporating aspects of the target culture.

Talk is an Internet program that connects two computers anywhere on the Internet permitting real-time interaction. The screen is divided into two halves where each user can type in one and see what the correspondent is typing in the other. Students might be intimidated by the need to type in the target language in real time, but one could envisage a scenario where English students in Germany type German to German students in the US who, in turn, type English back to their German counterparts. Each group would see the language in use by native speakers from the other side of the world. The synchronous

communication helps to give the language a reality that cannot be matched. An alternative to Talk is an audio conferencing system that lets individuals using multi-media computers to speak into a microphone. Their voice is digitized then sent over the Internet to another computer where it is converted back to sound. Voice communication on the Internet is still in its infancy and can be quite expensive.

Video conferencing requires even more resources than voice conferencing. Two computers with a microphone and a camera can be connected via the Internet to allow two individuals to converse face to face. The transmission speeds and data path required to accomplish this are not available to all who have Internet access. The day will come when video conferencing on the Internet will be more common. This might be the wave of the future, but for now, obtaining the resources, setting it up, and paying for it are not trivial steps.

Searching the Internet

Finding useful resources on the Internet can be a daunting task for a busy teacher simply because of the sheer amount of information that is out there. Although the advice gleaned by sharing ideas with colleagues is probably the most efficient way to learn about materials and projects (aside from reading this volume, of course), tools are available in the Internet itself that can help track down materials related to specific topics by performing keyword searches.

Veronica

It is possible to browse through Gopher menus for hours, finding interesting items and keeping track of them by creating bookmarks. Several listings of FL related Gopher resources such as the one provided by FLTEACH can save a lot of time. Veronica is another tool that can help dig through the Gopher maze to find specific items. A Veronica is a search engine that will hunt through all of the Gophers in the world to find any menu items that contain the words requested. It does not look at the content of files that it finds, just the Gopher menu titles. Veronica searches through Gophers the world over to create and maintain an index of the words used in menus and where they can be found. Performing a Veronica search results in a Gopher menu of items from many different Gophers, all including the target words. If browsing through the items in this list turns up a useful resource, a bookmark will save it for future reference.

Veronica is not an Internet client application itself. It runs through a Gopher client, so to use it you must first be connected to Gopher. Veronica can be found as a menu item on many gophers. If you have trouble finding local access to Veronica, one good place to find it is at the University of Minnesota. Go to the Gopher menu at
gopher.micro.umn.edu
Then look at the item:
Other Gopher and Information Servers
and in that menu select:
Search titles in Gopherspace using veronica

The syntax for Veronica can be a bit complicated if you wish to fine tune the search, but a basic Veronica search is very simple yet quite powerful. When you select a Veronica search, Gopher presents a dialog box where you

can type in the query that you wish to perform. Suppose you were looking for information about "French cuisine." The simplest Veronica search would be the query:
french cuisine
This will return any Gopher menu items found containing both words, "French" and "cuisine." Veronica does not pay any attention to capitalization. It will return a maximum of 200 items unless you tell it to get more. Note that this will not find "Cuisine in France" or "French food." You can use boolean operands to target your search:
(french or france) and (cuisine or food)
returns the following list of items:
French Cuisine: Soigner son Cancer
CVF (Cuisine et vins de France)
France Fast Food Franchises
TESOL FRANCE: food (for thought)
HRC 171B: PCA IV - FRENCH CUISINE
French Cuisine: Soigner son Cancer
France Norwegian Food Imports Allowed

Note that searches often find a particular item in more than one location, as in the case of "French Cuisine: Soigner son Cancer" above. It is also useful to know that the wildcard * can be used to search for all words that begin with a string of letters. For example,
franco*
will find "francophone," "francophile," "francophones," "francophiles," "francocentrism," "Franco's Spain," "Franco' italian restaurant," "Franco-Prussian," Franco-American," anybody whose name is Franco, etc. Wildcards can turn up unexpected results and should be used carefully.

The output of searches can be expanded or limited through the use of tags. It is possible to get more than 200 items by specifying the number:
franco* -m1000
This will yield up to 1000 items. You can also specify the type of item you want by using the -t tag. To find only text files, you could use the query:
franco* -t0
To find only sound files, you would send:
franco* -ts
Here is a list of possible types from the FAQ (Frequently Asked Questions) file, "How to Compose Veronica Queries" (Foster).
0 -- Text File
1 -- Directory
2 -- CSO name server
4 -- Mac HQX file.
5 -- PC binary
7 -- Full Text Index (Gopher menu)
8 -- Telnet Session
9 -- Binary File
s -- Sound
e -- Event (not in 2.06)
I -- Image (other than GIF)
M -- MIME multipart/mixed message
T -- TN3270 Session
c -- Calendar (not in 2.06)

g -- GIF image
h -- HTML, HyperText Markup Language
For the beginner, knowing how to use Veronica can help to change Gopher from a maze into a library.

Archie

FTP servers around the world contain millions of files that might be of interest to someone. What should you do, though, if you are looking for a specific file (e.g., a computer program for producing accents in texts)? Someone told you about the program so you know it exists, but you do not know where to find it on the thousands of public anonymous FTP sites in the world. Because you are looking for a specific file, have some idea of the name, but do not know where to find it, Archie can come to the rescue. Just as Veronica searches Gophers to provide an index of keywords, an Archie server searches FTP sites the world over in order to prepare an index of all files that can be found.

To use Archie, you must first select one of these servers. They all have the same information so it is best to use the server nearest to you. If you are using an Archie client, you can then simply tell it which one of the more than 20 servers you want. In the Northeast US, we use archie.rutgers.edu. If you do not have an Archie client, you can still use Archie via Telnet:
Telnet archie.rutgers.edu

If you ask Archie where to find "accents," the Archie server will send you a listing of all the FTP locations where the a file with that name can be found. The listing will allow you to use FTP to get the desired file from the nearest site or to select alternate sites if the closest one is busy. When we performed this search, Archie sent us information about 81 files at 28 different FTP sites whose name contained the word "accents." Archie also sent some information about each of the files found, helping us to decide which one we wanted. Many of these sites had more than one file with that name, but quite a few had a program called easy-accents.hqx for the Macintosh, which was just what we was looking for. We could then select the anonymous FTP site that was closest to our location:
Host oswego.oswego.edu
Location: /pub/info-mac/cfg
FILE -rw-r--r-- 4979 02-May-1995 17:55:36 easy-accents.hqx
and use our FTP client to go get it.

Archie is probably not a program that you need to use too often unless you are frequently updating software on a computer system. It is most useful for tracking down publicly available shareware programs, like many of the Internet utilities used in this volume, that are stored on the network. When you do need it, however, nothing else will do the job.

Searching the WWW

A number of tools exist to help navigate the WWW. Because Web pages contain much more information than Gopher menus or the file names at FTP sites, these programs can search through the entire text in a page and produce keywords that are more closely reflective of the topics in the page. Thus a keyword search performed by one of these utilities has a better chance of finding the pages that are related to the keywords you provide. Some even calculate a probability of the degree of relationship so they can present the

listing in order from most to least likely to be what you are looking for. The complexity of these calculations means that, given differences in the performance of these WWW search tools, various users might have individual preferences for one or another utility. Try them out to see which seems best to you.

Because everything on the WWW is a page, these search tools are, in fact, Web pages themselves with their own URL. They use forms to obtain a list of keywords from the user and then search their database for matches. Like Veronica and Archie, these programs automatically scan the net in search of new information to add to their data base. When they find a new page, they extract keywords and also look through it for more links that they will eventually scan, and so on. The "Centre Universitaire d'Informatique World Wide Web catalog" (CUI WWW catalog) works by searching through a number of other collections of URLs. A few of the better known WWW search engines are:

Lycos
http://lycos.cs.cmu.edu
WebCrawler
http://webcrawler.cs.washington.edu/WebCrawler/WebQuery.html
WWW Worm
http://www.cs.colorado.edu/home/mcbryan/WWWW.html
Centre Universitaire d'Informatique World Wide Web catalog
http://cuiwww.unige.ch/w3catalog

Each of these allows the "surfer" to enter a series of keywords that will be used to match WWW documents. Generally, keywords need to be at least three letters long, and case does not matter. Any browser that you use will have specific directions and a description of what it does available right from its own page. After the query is submitted, the search page will return a result page with the addresses of all of the pages found to contain the keywords. By default, documents that contain all of the keywords are presented. Keywords must be carefully selected to target the search objective. Common words such as school will be found in so many documents that the search results will be useless. On the other hand, too many specific keywords could limit the search results to zero. Of course, a search that produces no results might also indicate a spelling error in typing the keywords, a possibility not to be too quickly discounted. Often, several searches are needed to get the desired results.

This simple procedure describes the CUI WWW catalog in Switzerland, making it the easiest to use. The others give the user more control by providing a few additional choices but to do so they also require a few extra decisions. The Lycos page or pages offer several options including searches of the entire data base of just the more common sites. If a search generates too many results, limiting the target in this way might help. The WebCrawler allows a limit to be placed on the number of documents presented. It also will let you modify the search to get documents containing any rather than all of the keywords. Be careful: this usually will get more than you bargained for. The WWW Worm (WWWW) provides the most control by restricting the area of the search and the number of resulting URLs. It also permits boolean operations using UNIX egrep expression syntax, not for the

faint of heart. But even the WWWW can simply be used in default mode so the user need not worry about these options.

Much is there to be discovered by surfing the Web, but it does take time. You might enter a search for individual words of interest to generate a long list of sites and then explore to your heart's content: e.g., all references to "Russian" or "Russia" or "Soviet." Or if you know just what you are looking for, you might do your best to zero in on one particular Web Page by specifying a restrictive set of keywords. Either way, these tools make the millions of URLs on the Web manageable for even the novice user.

11.5 Introduction to Search Engines (Google, Yahoo, Bing, etc.) and Email

A **web search engine** or **Internet search engine** is a software system that is designed to carry out **web search** (**Internet search**), which means to search the World Wide Web in a systematic way for particular information specified in a textual web search query. The search results are generally presented in a line of results, often referred to as search engine results pages (SERPs). The information may be a mix of links to web pages, images, videos, infographics, articles, research papers, and other types of files. Some search engines also mine data available in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintain real-time information by running an algorithm on a web crawler. Internet content that is not capable of being searched by a web search engine is generally described as the deep web.

Google is the titan of the search industry. The company constantly updates and innovates its search algorithm to maintain its position as the front-runner of the world of search.

That also makes it the most important search engine for search engine optimization (SEO) purposes.

Regardless, this is how Google's search algorithm works:

Google's algorithm includes roughly 200 factors it considers on each search

Google's crawlers index frequently-updated sites more often.

Google regularly updates their algorithm with significant changes, and they don't always announce those changes.

Google can index text content in Flash files.

Google considers click-through rate (CTR) and external link as major factors.

Google generally values user experience above all other factors. So if your page is user-friendly, it'll also do well in Google search results.

In addition, you also have Google search features that affect how websites are displayed in results.

Similar Google searches can show in a carousel at the top of the page.

Google's knowledge graph could answer your search without requiring you to click.

Images may show at the top or side of the page.

Map results may show at the side of a page.

Paid ads show at the top and side of a page.

Local business listings show at the top and side of a page.

Google's practical jokes and Easter eggs (like "askew" or "do a barrel role") can alter the appearance of results.

Generally, Google is much more text-based.

With those characteristics in mind, you should have a basic idea of how Google functions for most searches.

Bing / Yahoo

The reason we're discussing Bing and Yahoo in the same section is because they're actually the same search engine.

Both companies run off of Bing's search, and that means Yahoo is more of a web portal than a search engine (like it was in the 1990s).

As a result, they share the same algorithm characteristics:

- Bing also uses about 200 ranking factors to determine search results.
- Bing favors pages that are connected to social media accounts.
- Bing can read Flash files.
- Bing considers a site's CTR and external links as primary factors.
- Bing prefers sites that provide a good user experience.
- Bing uses authorship metrics through a partnership with Klout.

Let's also take a look at the search result features in search results:

- Bing tries to show all variations of a search term if it's vague.
- Bing's snapshot pane could answer your search before you click anything.
- Images, videos, and related search results could all show at the top and side of search results.
- Paid ads show at the top and side of search results.
- Bing doesn't use practical jokes or Easter eggs in its search results.
- Generally, Bing is much more visual-based.

So how can you make sure your site shows up in search results for all three of these search engines?

Optimizing your site for Google, Bing, and Yahoo

Because of the subtle nuances of these search engines, there's not a single catch-all solution to optimizing your site for all of them.

Instead, you need to go through your site step by step and make sure it's optimized. These are seven tips that will help you optimize your site for all search engines.

Make your site mobile-friendly. Google already uses it as a ranking factor, and Bing is close behind.

Create a positive user experience. Easy navigation, modern web design, and informative content all play a part in a good user experience.

Use keywords in your title tags, image alt attributes, and meta descriptions.

Use authorship whenever possible since Bing looks at it (Google does not).

Use Flash sparingly. If you use it, include plain text around it so Google understands what the page is about.

Build external links. Links are most likely the biggest factor for both Google and Bing's algorithms.

Email

The application of Information Communication Technology (ICT) has reconfigured the characteristics of learning environments. ICT have propelled learning environments leaps and bounds providing greater opportunities for higher education, researching, instructional teaching and even affords student, teacher and group collaboration. ICT learning embodies facets of the activity – based learning theory which highlights how individuals learn and acquire knowledge by actively exploring, reflecting on and assimilating features thereby creating a better understanding of the functions of ICT tools.

Learning environments incorporate a variety of ICT tools to support the learning process, one ICT tool frequently used in is the communicative medium referred to as E-mail. E-mails are ubiquitous and have strengthened the learning process, however with its integration there emerges what is known as affordances and constraints.

Affordances are about effectiveness (John & Sutherland, 2005). Salomon (1993) defined affordances as the perceived and actual properties of something, essentially being those properties that determine how the element could be possibly used in a specific situation. By this, one can assume for e-mails to be an effective ICT tool, it depends on accessibility which affords us the opportunities and the competencies of students and teachers to adapt to and manipulate it so it affords them their perceived learning outcomes. Likewise constraints are also associated with the use of E-mails and can take the form of physical, logical or cultural constraints (Norman, 2004). Constraints often regulate the efficacy of E-mails.

One affordance of E-mails in the early learning environment is that it boosts information and communication giving consideration to distance and time. E-mails allow staff, parents, communal members and the wider society for example supervisors to communicate and exchange information at a faster pace almost instantly. The use E-mails in this setting is at low cost, has the potential to build relationships both work and personal, relay pertinent information quickly and with timely feedback and also has the ability to develop teaching methods through collaboration.

One constraint of E-mails in the early childhood setting is the inability of staff, parents and other users to appropriately use E-mails for specific learning outcomes and standards. This can either be in the form of lack of knowledge on writing and sending E-mails and writing and sending of irrelevant information. When either of this is done the purpose of building communication lines are misused and damaging to the early childhood setting.

In an effort to work around this constraint all involved can be educated on the responsible and appropriate use of writing and sending E-mails. This can be done through ICT educational sessions, conferences and workshops. The use of print (brochures, posters and flyers) can also be used to share information relating to the use of E-mails in the learning environment.

Cited in John & Sutherland (2005), E-mails are an effective ICT tool in learning as it is able to extend the capabilities of humans for manipulating things in the environment. (Rasmussen, et. al., 1994). However it is only effective once there is a basic understanding of its applications in the learning environment.

11.6 Blogging and its use in teaching

There are numerous educational benefits of blogs. Blogs are:

- Highly motivating to students, especially those who otherwise might not become participants in classrooms.
- Excellent opportunities for students to read and write.
- Effective forums for collaboration and discussion.
- Powerful tools to enable scaffolding learning or mentoring to occur.

Blogs can serve at least four basic functions.

1. Classroom Management

Class blogs can serve as a portal to foster a community of learners. As they are easy to create and update efficiently, they can be used to inform students of class requirements, post handouts, notices, and homework assignments, or act as a question and answer board.

2. Collaboration

Blogs provide a space where teachers and students can work to further develop writing or other skills with the advantage of an instant audience. Teachers can offer instructional tips, and students can practice and benefit from peer review. They also make online mentoring possible. For example, a class of older students can help a class of younger students develop more confidence in their writing skills. Students can also participate in cooperative learning activities that require them to relay research findings, ideas, or suggestions.

3. Discussions

A class blog opens the opportunity for students to discuss topics outside of the classroom. With a blog, every person has an equal opportunity to share their thoughts and opinions. Students have time to be reactive to one another and reflective. Teachers can also bring together a group of knowledgeable individuals for a given unit of study for students to network and conference with on a blog.

4. Student Portfolios

Blogs present, organize, and protect student work as digital portfolios. As older entries are archived, developing skills and progress may be analyzed more conveniently. Additionally, as students realize their efforts will be published, they are typically more motivated to produce better writing. Teachers and peers may conference with a student individually on a developing work, and expert or peer mentoring advice can be easily kept for future reference.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the types of Network

…………………………………………………………………………………
………………..………………………………………………….……………
…………………………………………..……….……………………………

2.Write the Examples of Personal Area Network:

…………………………………………………………………………………
…………………………………………….……………………………………
……………………………………………………….…………………………

11.7 LET US SUM UP

In this unit you have learnt the concept of **Internet**

11.8 UNIT- END- EXERCISES

1.Write Advantages of Wide Area Network

11.9 ANSWER TO CHECK YOUR PROGRESS

Geographical area: A Wide Area Network provides a large geographical area. Suppose if the branch of our office is in a different city then we can connect with them through WAN. The internet provides a leased line through which we can connect with another branch.

Centralized data: In case of WAN network, data is centralized. Therefore, we do not need to buy the emails, files or back up servers.

Get updated files: Software companies work on the live server. Therefore, the programmers get the updated files within seconds.

Exchange messages: In a WAN network, messages are transmitted fast. The web application like Facebook, Whatsapp, Skype allows you to communicate with friends.

Sharing of software and resources: In WAN network, we can share the software and other resources like a hard drive, RAM.

Global business: We can do the business over the internet globally.

High bandwidth: If we use the leased lines for our company then this gives the high bandwidth. The high bandwidth increases the data transfer rate which in turn increases the productivity of our company.

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BLOCK IV
SOCIAL NETWORKS, E-LEARNING AND DIGITAL STORY TELLING

UNIT XII SOCIAL NETWORKS

Structure

12.1 Introduction

Social networking is the use of Internet-based **social media** sites to stay connected with friends, family, colleagues, customers, or clients. **Social networking** can have a **social** purpose, a business purpose, or both, through sites such as Facebook, Twitter, LinkedIn, and Instagram, among others **Social networks** are the relationships that tie us together. Think about what happens when you meet someone new. You ask where they **work**, where they grew up, where they went to school. ... A **social network** is a **social** structure that maps out the relationships between individuals

12.1.1 Facebook

Facebook is an American online social media and social networking service based in Menlo Park, California and a flagship service of the namesake company Facebook, Inc. It was founded by Mark Zuckerberg, along with fellow Harvard College students and roommates Eduardo Saverin, Andrew McCollum, Dustin Moskovitz and Chris Hughes.

Facebook is a website which allows users, who sign-up for free profiles, to connect with friends, work colleagues or people they don't know, online. It allows users to share pictures, music, videos, and articles, as well as their own thoughts and opinions with however many people they like. The official stated **purpose of Facebook** is to make the world more open and connected. **Facebook's** latest mission statement is that people use **Facebook** to stay connected with friends and family, discover what's going on in the world and share and express what matters to them.

Advantages & Disadvantages of Facebook — In the marketing point of view, Facebook is valuable to **create a brand** not only for individuals but also for businesses at the global level. The **Facebook benefits** include as a **social networking pros** provides benefits for business and individuals too, such as making a group, chatting with clients, making an event, wall stickers, reliable platforms, news feed, etc. you can meet new people & have knowledge of various places, traditions & culture. No doubt, Facebook is proved as **a great option to connect with the world** these days. Moreover, now you can **access Facebook free without Internet** from any kind of mobile device.

Most of people use FB in day-to-day life; even many people spend hours-&-hours on Facebook. But there are **advantages/disadvantages social networking sites**; it's now important to not to get addicted to it. And here is the actual hole in the ship that brings the **drawbacks of social media marketing** following FB as disadvantages of Facebook for business. Today this article will list all **pros & cons of the Facebook** usage.

However, the coin always has the two sides so you must know both sides of the Facebook & try to be aware of the **Facebook drawback**s & go with the **Facebook benefits**. Check not only out the facebook advantages and disadvantages for business but also the **benefits of social media** in business, **advantages of social media** in day-to-day life, **disadvantages of using internet**, pros of social media, benefits of Facebook, **positive impact of social media** and get to know that **the Facebook isn't the social network anymore.**

Advantages

1. Better Socializing - Facebook is changing the way we think & feel.

You can connect with the world by just signing into Facebook. You get the information about various sectors, peoples, their culture, religion; it's a social platform where the world comes together. Facebook isn't a social network anymore. Sometimes it could be a better matrimony site or advanced version of *penpalworld*. **It is easy to find out like-minded people by seeing their interests, & you can easily connect with them by looking up their wall updates, interests, & here you can connect with them by sending a free message.**

2. Chatting: A better Internet communication.

Fb provides you the chat option so that you can talk with your friends, family members through FB just by using your laptop, & even with your mobile phones. Facebook has launched the Messenger app earlier for mobile users by means of chatting purpose. Facebook can be used as video chatting tool. With the implementation of Skype partnership, Facebook has started video chatting using FB inbuilt video chat service. Moreover, using WhatsApp video calling feature, **you can make free video calls to your friends.**

3. Find & invite your friends.

It's the most amazing thing to find your old friends, & to keep in touch with them. **Friend Finder feature helps you to find out your friends, with their names or email addresses.** You can see their photos, updates & keep up to date with what they are doing. It is really real that many people found their old friends once again on FB they never knew they will ever contact again & they are not only now connected with FB but in real life too.

4. Business promotion

It is one of the biggest advantages of Facebook. Through FB ads & fan pages, you can advertise your business. It helps you to maintain a good relationship with your customers. This is really important as in business you can sell or promote your product or service to the targeted audience & increase your brand value & social media presence for your business. There are billions of active users on FB, so it's the best platform for any kind of business to fetch the right kind of customer. **You can start making FB pages for your brand or company & can use this advantage to earn money online.**

5. Entertainment unlimited

Facebook is the best thing to spend your time when you don't have to do anything & just getting bored. You can see your friends post, or share your photos, status, or even play games on FB. Yes, FB has a game corner where you can play games alone, or along with your friends. It's just like endless entertainment.

6. Free

The best part of Facebook is that you do not have to pay money for its use & it's the best medium for communication in the social networking sites. Messaging, video calls, uploading photos & videos without any charges don't you think this is the best part of the FB. Lots of active users use Facebook as a personal diary, where they upload and post their day-to-day life events and also post valuable notes with social friends.

7. A platform to share feelings, life events

Through Facebook, it is very easy to share your feeling, opinion & what's happening in your life. It's just like a platform you can use in your own way to share what's going into your mind, your achievements, sorrows, happiness all feelings can be expressed & then you will able to get some guide, support, or help from your generous friends.

8. **Pages, groups, news-feed**

These features of Facebook are most amazing. **I think FB gets most favorite just because of these several applications, features available under one roof.** News-feed plays a significant role in getting the latest information. In the case of fan pages, the admin or the users publish the post, news, info, photos, videos, etc. regularly to stay connected and being engaged with their fan followers.

Disadvantages

1. **"Facebook Addiction" A new disorder**

There are many, who are addicted to FB. **People just start living in this virtual world & spend hours & hours on Facebook. Due to this, a new type of disorder has also come in human life i.e. Facebook addiction disorder** in which person spend far too much time on Facebook, have difficulty cutting back. Furthermore, this disease keeps you away from real people and eventually creating problems with real-life relationships, relatives, school, or in the career. This is the biggest disadvantage of the Facebook site.

2. **The fight continues against fake profiles & phishing bots**

Opening an account, **making a fake profile & ID is simple for anyone on Facebook.** And there is no limit for these fake profiles. **There are so many cases of harassment & abuse that are often formulated by the fake accounts.** Once you get into this trap, it would be very dangerous. Many cases have been reported about these fake accounts, bullying, stalking, blackmailing, due to which many lives have been destroyed especially, teens.

3. **Scams are spreading like fire**

Suspicious emails, messages & notifications are the most widely used trick to hack your account & to get your personal information by using the phishing website that looks similar to the original Facebook site. Hackers send continuous emails asking for login data to check your newsfeed, new photos of their friends, & something akin to this. When you open that website, with the link given in that email, it 100% looks like original Facebook. And the user didn’t even know that the hackers are stealing his account details. In this way, the scammers are trapping thousands of people on FB.

People received some scam messages from scammers & ask something about your bank details by telling them that they have won some prize & you are the lucky user. **The user then gets attracted to the fake offer, click on the fake link, open fake site but then put his real login info and then he got phished by scammer successfully. And the ultimately this result to massive loss of your money, mental health & lots more.**

4 Can’t keep things personal

People are now used to reportedly sharing fewer personal updates on Facebook. The updates from you, about your private life, come in terms of the notification of your friends & other friends of friends so that your privacy is compromised automatically. It's a fact if you see, every breakup, makeup, adventures, emotions are uploaded up there & the main reason behind this is most obvious to seek the attention of the people & to get share & be social, get likes, & comments. **It’s a cycle that once you start updating about everything, then you can’t stop yourself further anymore.**

5. Criticism

There are many groups & pages on Facebook published which is being created to abuse or violate other religion, personalities, nation, etc. This kind of activities disturbs the social environment. Many cases of public violence & religious tensions, many false rumors are spread through Facebook. The pages & groups that condone extremist, incepting points of views, & create abusively or attacking posts & hate speech about different religions, personalities, nationalities, etc. and especially used to misguide the people & increase the malice in them. These discriminatory & often racist activities are not acceptable on global sites like FB

6. Effect on academic’s activity

Too much time on FB has proper with bad grades on the student's results. Even it’s often found that many employees waste their time for surfing FB. That’s why many offices have blocked these kinds of sites from their networks completely.

7. Data privacy issues

The Facebook provides you the reliable & secure privacy settings, but many people don’t use these settings properly, that causes an effect on your personal info that you provided and shared by using the Facebook. Now a day’s people have many tricks to view your private FB profiles. Even Facebook profile pictures are also not safe. Moreover, the games such as Farmville, or some popular quiz apps, where you permit an application to be installed with your profile that you might not be aware that you are allowing them to manage your private info & to use your data with the third party.

12.2 WhatsApp

About WhatsApp

WhatsApp is a messaging app that lets users text, chat, and share media, including voice messages and video, with individuals or groups.

How **does WhatsApp work**?

WhatsApp relies on data to send messages, like Message or BBM, so it doesn't cut into your monthly text allotment **WhatsApp** uses your phone's cellular or Wi-Fi connection to facilitate messaging and voice calling to nearly anyone on the planet, alone or in a group, and is especially nice for families and small collaborative workgroups. The app lets you make calls, and send and receive messages, documents, photos, and videos.

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WhatsApp can provide a channel through which teachers can achieve faster and more seamless communication with their students. It can also increase the level of communication between students and create another venue for learning

Education Strategies for WhatsApp

Here are some basic strategies that educators can utilize to take advantage of the core abilities of WhatsApp:

1. Use the Group Chats feature to create learning and study groups
2. Create audio lessons that can be sent directly to students
3. Stay in contact with students outside the classroom
4. Send out problems or assignments to students even when they are not in class
5. Stay in contact with parents
6. Send videos to students
7. Send graphics such as pictures or charts directly to students
8. Send report cards directly to the parents' phones
9. Facilitate real-time communication between students and teachers.
10. Facilitate real-time communication between teachers and parents.
11. Teachers can also maintain communication with students .

Use WhatsApp in the Classroom:

- It allows free unlimited messaging
- It can be used directlyover the Internet via WhatsApp Web.
- WhatsApp can be used on Wi-Fi without a data plan.
- Unlike some messaging solutions, WhatsApp can be used to send videos, audio messages, and pictures.
- WhatsApp is a cross platform solution.
- WhatsApp can be used to reach students via the technology they are most familiar with: their phones
- WhatsApp can be used to reach students and parents that do not utilize other communication methods, such as landline telephones and email
- WhatsApp is very cost effective



WhatsApp is free to download messenger app for smartphones. WhatsApp uses the internet to send messages, images, audio or video. The service is very similar to text messaging services, however, because WhatsApp uses the internet to send messages, the cost of using WhatsApp is significantly less than texting. You can also use Whatsapp on your desktop, simply go to the Whatsapp website and download it to Mac or Windows. It is popular with teenagers because of features like group chatting, voice messages and location sharing.

UPDATE: Under the new E.U General Data Protection Regulation (GDPR), Ireland has now set the Digital Age of Consent to 16 years old. This is the age at which children can legally consent to companies/organisations processing their personal/data or information for example when you sign up to an online platform or social media account. For children under the age of 16 consent must be give/authorised by the parent of guardian of the child.

Growth of WhatsApp

WhatsApp, owned by Facebook, now has 1 billion users worldwide and is the biggest online messenger app on the market. Founded in 2009 by ex-Yahoo employees it started as a small startup and swelled to 250,000 users in just a few months, growing so fast that they had to add a charge for using the service per year to slow the subscription rate down. In 2014, WhatsApp was acquired by Facebook and has seen continued growth, reaching the 1 billion mark in July 2017.

It is popular with teenagers because of features like group chatting, voice messages and location sharing.

Using WhatsApp

To use WhatsApp you need a compatible smartphone or tablet with a sim card, an internet connection, and a phone number. The app uses your phone number as its username, and your account is locked to the phone, although you can transfer your contacts over to new devices. Whatsapp is free to use in Ireland. However, if abroad, the Whatsapp website states:

12.3 Twitter

Twitter is a 'microblogging' system that allows you to send and receive short posts called tweets. Tweets can be up to 140 characters long and can include links to relevant websites and resources.

Twitter users follow other users. If you follow someone you can see their tweets in your twitter 'timeline'. You can choose to follow people and organisations with similar academic and personal interests to you.

You can create your own tweets or you can retweet information that has been tweeted by others. Retweeting means that information can be shared quickly and efficiently with a large number of people.

Twitter has become increasingly popular with academics as well as students, policymakers, politicians and the general public. Many users struggled to understand what Twitter is and how they could use it, but it has now become the social media platform of choice for many.

The snappy nature of tweets means that Twitter is widely used by smartphone users who don't want to read long content items on-screen.

Twitter allows you to:

- ✓ easily promote your research, for example by providing links to your blog stories, journal articles and news items
- ✓ reach a large number of people quickly through tweets and retweets
- ✓ follow the work of other experts in your field
- ✓ build relationships with experts and other followers
- ✓ keep up-to-date with the latest news and developments, and share it with others instantly
- ✓ reach new audiences
- ✓ seek feedback about your work and give feedback to others
- ✓ follow and contribute to discussions on events, for example conferences that you can't attend in person
- ✓ express who you are as a person.

The type of information you tweet can depend on whether you are tweeting as an individual or as an organisation, project or group.

If you have a personal Twitter account you may want to mix tweets about your research with tweets about other things that are of interest to you, for example hobbies, news stories and general observations. Insights into non-academic aspects of your life can help make you an interesting person to follow.

If you are tweeting on behalf of an organisation, project or group then you may choose to only send research-related tweets. Twitter is a relatively informal communications tool so don't be afraid to embrace a personal, friendly and humorous approach to tweeting.

Examples of things you can tweet

- Details of new publications or resources you've produced
- News items that feature your research
- Links to any blog posts you've written
- Thoughts on conferences you attend
- Questions to invite feedback
- Interesting news items you've found
- Interesting photographs
- Replies to other people's tweets
- Retweets of other people's tweets

12.4 Skype

Skype is an IP telephony service provider that offers free calling between subscribers and low-cost calling to people who don't use the service. In addition to standard telephone calls, Skype enables file transfers, texting, video chat and videoconferencing. The service is available for desktop computers, notebook and tablet computers and other mobile devices, including mobile phones. A number of companies, including Skype, produce dedicated Skype phones.

Included in the free service is a softphone application that can be downloaded to any computing device running Windows, Macintosh, Linux, or Windows Mobile operating systems. A function called SkypeOut enables calls to regular telephones; these calls are charged to a prepaid account or to a flat-fee annual subscription.

Skype's benefits, beyond the free and low-cost calls, are said to include easy set-up and good audio quality. To use Skype from a desktop computer, you just plug in a headset, a specialized VoIP phone or a regular phone (via an analog telephone adapter). You add contacts similarly to the way you do for instant messaging and then, to make a call, just click the icon next to the contact.

12.5 M-learning in education

Mobile learning (**m-learning**) is education via the Internet or network using personal **mobile** devices, such as tablets and smartphones to obtain **learning** materials through **mobile** apps, social interactions and online educational hubs. It is flexible, allowing students access to education anywhere, anytime.

Wherever and whenever

It's possible to lay in bed and watch a lecture or complete a survey whenever you want.

Motivation

"We are going to take an online quiz!" You can see the smile on the children's faces. Children are motivated to learn when they can use tablets or other mobile devices.

Employees also feel more motivated to learn something new or to take a training if they can take their learning materials everywhere with them, especially when they don't have time to learn during their regular work hours.

Different types of content

You can add videos, audio files, and images with mobile learning. Videos make it possible to make learning livelier and more interesting.

Long distance is not a problem

While one learner might be in New York and the other in Amsterdam, it's still possible to view the same content and take the same tests! This is one of the main benefits of mobile learning.

Disadvantages of mobile learning

Distraction

Mobile devices can be a great distraction for participants. Children like learning on tablets, but gaming on tablets seems to be even more fun! As a teacher you are not always able to control what your pupils are doing on their tablets.

For adults, mobile learning can also be distracting if your users get constantly interrupted with text messages and notifications. Therefore, it requires self-discipline and focus on their part.

However, if you can make your training interactive and fun, the other applications available on mobiles won't be a distraction for your learners.

Lack of Internet connection or electricity

Using mobile devices for e-learning could be an issue if your users don't have Internet connection or electricity readily available.

In spite of that, data gathered by GSMA intelligence indicates that there are now more mobile devices than there are people in the world. Considering the enormous growth of mobile devices, a lack of Internet connection, poor connection quality, and restricted access to electricity should become problems of the past.

M-learning and our LMS

Mobile learning is certainly possible with our learning management system. The interface is set up to be fully responsive, which means it will look awesome and work beautifully on all sorts of devices, desktops and mobiles.

Mobile Apps for Teaching

Mobile devices integrate a series of features used in various learning environments. In some mobile learning applications currently available, mobile features are being utilized for various educational practices include the use of Short Message Services (SMS), GPS, camera, browsing, downloading, bluetooth, Wi-Fi, voice calls and gaming. Like that lot of mobile apps are using for teaching and learning process. The following are some of mobile apps are using for teaching to the teachers.

- **ClassDojo:** ClassDojo is a virtual classroom app. Unlike others, ClassDojo doesn't replace the entire classroom experience but does replace the non-learning parts. Teachers can use this app to replace things like gold star charts so that parents and students can track the child's good behavior from home or on the go. There is also a messaging feature built in so everyone can stay in communication and kids can do things like create their own accounts and customize their avatars.
- **Edmodo:** Edmodo is another virtual classroom app but this one goes the whole nine yards. Using it, you can create a virtual classroom where students can post and turn in assignments, collaborate with teachers (and parents can be included too), track progress, and everyone can upload files, photos, and videos. There is also an integrated grade book so teachers can post grades and students can see them immediately. It's a great addition to the classroom experience and very powerful.

- **Google Classroom**: Google Classroom is another great alternative if you're looking for a virtual classroom on Android. Google Classroom is actually a web platform that recently got an Android app so teachers, students, and everyone else can access it via the web or through the app. The app lets students stay organized with what's due in class, turn in assignments, upload files, images, and video, and more. There are also communication options and

Google Drive integration. The only caveat is that you will need to set up a Google Apps for Education account.

- **Google Drive**: Google Drive is a great cloud-based application. As a teacher you can upload assignments and issue download links to your students so they can download course materials as their leisure. There is also the possibility of collaboration on documents, spreadsheets, and presentations so students can work together and teachers can oversee. The biggest advantage is that the app is totally free to start with.The only time it will cost you money is if you need additional storage and it's not very expensive.
    - **Microsoft Office**: Microsoft Office is literally the only office suite that can compete with Google Drive on this level. Much like Google Drive, Microsoft Office consists of a cloud storage service (OneDrive) along with Word, Spreadsheet, and PowerPoint. The big draw here is that many universities, schools, and such not only use Microsoft Office on PC, but also give it away to students at the university level (Microsoft Office for Students). This allows for a consistent experience across all platforms and offers most of the benefits of Google Drive.
    - **PBS Kids Video**: PBS Kids Video offers over l000 videos from PBS that are perfectly suited for young minds learning new things. There are even some educational features build in like education goals so you can teach, they can watch, and everyone has fun. It also comes with Chrome cast support so teachers who have access to HD TVs can stream it without much difficulty.
    - **Quizlet:** Quizlet is a flash card app that is wildly useful for helping people learn. Teachers can create their own sets of flashcards for students or students can make their own. There are also thousands upon thousands of flash card sets made by other people that you can use. It's true that flash cards are a bit old school but they're still an effective way to learn things such as foreign languages ormath.
    - **TED**: TED is almost the same as PBS Kids Video; but it is more oriented at a more scholastically mature audience.

The app features talks and lectures that cover a plethora of topics and created by experts and visionaries in that field. There are subtitles in over 90 languages and you can download talks to watch offline if you need to.

12.6 Mobile learning their Educational Uses.

MLearning is better than conventional schooling in different ways.

While there are several notable features of mobile learning, one feature that tops all the rest is the added convenience for mLearners. This way, you get to learn without having to change your schedule or compromising other important activities, irrespective of where you are and what you do.

What's more, mLearning supports instant sharing and transferring learning content; this also allows to use an instant feedback system. Feedback is important because it encourages effective learning by giving a prompt assessment.

From a learning perspective, different studies show that mLearning is far more effective than conventional learning approaches. This is mainly because of things like convenience, peace of mind, and feedback that it offers to the learners. Actually, the mLearning process is proven to raise exam scores by about 50 to 70% while cutting dropouts in technical fields by 22%.

Apart from the above-given reasons why mLearning stands out, another important feature attached to this approach is the use of gadgets for education. In today's world, everyone is more likely to read and learn using digital devicesrather than reading paper books. This is exactly what mobile learning takes into account.

Learning through digital gadgets lets learners have more space for exploring and asking questions. This method is much cheaper than conventional classroom learning setups as educators and learners don't have to pay for venues, electricity bills, and other relevant expenses, let alone the environmental impact of reduced paper consumption.

History of m -Learning

Alan Kay is the name behind the introduction of the m -Learning concept in the 1970s. He got into Palo Alto Research Center of the Xerox Corporation and teamed up with a few other workers to bring 'Dynabook' to life. Dynabook was a handy personal computer that was meant to teach children through an improved digital approach. However, this device failed to impress because of a lack of technological backing in that era.

It wasn't until 1994 that IBM Simon, the first smartphone ever, was introduced by Mitsubishi Electric Corp; this device was quite similar to Dynabook. Promoted as a handy personal communicator, this smartphone heralded an absolutely new era during which hundreds of similar devices were introduced by various manufacturers. From then on, nobody ever stopped producing 'smartphones'.

To simplify the introduction to m -Learning, it has been divided into three phases. These include:

Phase 1
This phase revolves around the use of mobile devices, such as smartphones, tablet computers, and laptops. Here, educators work to plan lessons that can be easily delivered and accessed through digital gadgets. Even when they can't work with all sorts of devices, they can focus on at least one device with specialized applications that support m -Learning. They should be highlighted and communicated to the learners, too.

Phase 2
Phase 2 is focused on learning in settings different from a typical classroom. This can include things like field trips, visits to museums and places alike. Today digital gadgets support strong Internet connection and this is what educators can take advantage of during such visits in order to communicate with their students without using teaching materials like black/whiteboards or even desktop computers.

Phase 3
The third and the last phase focuses on the mobility of learners. Today, mLearning has become a globalized learning approach. It has gained popularity in regions across the world including Asia, Europe, Australia, Africa, New Zealand, North America, and Scandinavia which have already attained remarkable achievements in this area.

The Importance of m -Learning

Now that we know everything about the concept of mobile learning and its history, let's look at the uses and benefits of mobile learning and a few notable challenges that mobile learners face. The concept of mLearning is not new anymore. Numerous schools and other educational institutions are trying to adopt this technology to be able to better educate learners through laptops and mobile phones. This approach not only is effective and handy, but also fun, and this is why it encourages learning among people of all ages. That is why so many educational applications are introduced and made available to educators and trainers every day.

Uses of Mobile Learning in Education

Creation of Mobile Learning Materials

The easiest way to educate and learn through mobile learning is by developing learning materials/content. These can be anything from videos and audios to texts and infographics. Learners can be given assignments to complete after studying the materials.

This approach of online education is comparatively less interactive but allows users to take enough time to grasp what is being shared, unlike highly interactive sessions. This is known as an asynchronous approach of mLearning, i.e. where the educators and learners are not directly in contact.

Interaction during Lessons
For those educators and learners who prefer interactive learning, mobile devices are the best option. This sort of learning encourages learners to ask questions and discuss other relevant topics on online forums of discussion.

This activity can also go the other way round where the educators ask questions about the lesson and the learners answer them by using their devices or by communicating on a predefined online forum. This method is especially recommended where trainers teach a large number of students.

The learners can even be asked to complete surveys after lessons so that the educators can get prompt feedback in addition to being able to analyze how effective their lessons are.

Synchronous learning

Synchronous learning is the exact opposite of asynchronous learning. In such a setting, students and teachers can communicate in real-time. This approach is preferable when teachers and students deem feedback and interaction important. Both real-time feedback and real-time interaction with students give a great impact on overall learning.

Benefits of Mobile Learning

Anytime, Anywhere

With mobile learning, you can learn with fun from home or anywhere else you feel comfortable learning. You don't have to sit straight up and make eye contact with the trainers just as conventional classrooms do. In such a setting, you can simply lie down in your bed with a bag of chips in your hands and watch/listen to a lecture or read through lessons. It's no different from watching a movie, except that it is not for entertainment purposes.

Enthusiasm
As discussed before, learners today are more likely to enjoy learning through digital gadgets than paper books. You can test the same by announcing 'we are going to have a dictation today' in both physical and virtual classes. The reaction that you will get from the children in the

mLearning setup will definitely be far better than those who study in classrooms.

The same is the case with the professional world. More employees will be happy to attend online training and sessions than sitting in the training room and act like students.

Apart from the convenience, one important reason behind mLearning being widely preferred is that the world today is all about technology and this has brought people to be comfortable during interactions that aren't one-on-one.

Diversity in Learning Resources

With mobile learning, educators can add videos, audios, visuals, and event different text styles to make lessons seem interesting. These resources make education more fun and interesting.

Easy Access to Quality Education

Since mobile learning allows learners from all over the world to come and learn together, there is no need for anyone to worry about getting a quality education or even traveling locally or internationally to get it.

You can be in third world countries and still have easy access to quality education that developed nations have to offer without having to spend a bit on traveling and other expenses.

Mobile Learning Challenges

A Lack of Focus and Attention

It is easy for mobile learners to get distracted because of several entertainment options that come handy with digital gadgets. Whether the students are children or adults, things like games and social media can easily divert them away from the lessons being taught. Indeed, mobile education is fun. But it can never be more fun and interesting than socializing or playing games.

With that said, self-discipline and strong focus are the essentials of successful mobile learning. However, this can also be controlled by arranging live and interactive sessions with the learners, allowing short breaks, and incorporating fun activities and games into learning plans.

Increased Dependence on Electricity and Internet Connection

With mobile learning, users are fully dependent on electricity and internet connection. In fact, mobile learning is simply not possible without these two. This could be an obstruction for those who live in areas where internet connection and electricity are not readily available.

Nonetheless, despite the challenges associated with mobile learning, a majority of educators and learners are considering this learning approach these days. This means that even people in rural areas of the world are making efforts to combat electricity and internet issues in order to become mobile learners. And that simply tells how effective and interesting this learning approach is.

In fact, for those who fail to take online lessons can even have continuous access to learning resources like articles, videos, audios, visuals, and even text. This on-demand availability has further contributed to the success and fame of this learning approach.

These benefits of mobile learning and others, like eco-friendliness, cost-effectiveness, convenience and level of fun derived from learning, have even compelled corporate giants and growing businesses to switch from physical to virtual training setups.

Because of the continuous introduction of new devices and the varieties that are available today, the prices of mobile devices have dropped down radically over the years. This is the cherry on the top for those considering mLearning. This implies that everyone, from those who are young to the aged, can easily make a one-time investment to get years of learning and fun. Not a bad deal at all!

So, now that you know all about mobile learning, do you think these benefits are something you can easily let go of? We think not!

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the Disadvantages of mobile learning…………………………………………………………………………
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…………………………………..…………….…………………………………………
………

2.Define Google Classroom
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12.7 LET US SUM UP

In this unit you have learnt the concept of **Social Networks**

12.8 UNIT- END- EXERCISES

1. Define Skype

12.9 ANSWER TO CHECK YOUR PROGRESS

Skype is an IP telephony service provider that offers free calling between subscribers and low-cost calling to people who don't use the service. In addition to standard telephone calls, Skype enables file transfers, texting, video chat and videoconferencing. The service is available for desktop computers, notebook and tablet computers and other mobile devices, including mobile phones. A number of companies, including Skype, produce dedicated Skype phones.

Included in the free service is a softphone application that can be downloaded to any computing device running Windows, Macintosh, Linux, or Windows Mobile operating systems. A function called SkypeOut enables calls to regular telephones; these calls are charged to a prepaid account or to a flat-fee annual subscription.

Skype's benefits, beyond the free and low-cost calls, are said to include easy set-up and good audio quality. To use Skype from a desktop computer, you just plug in a headset, a specialized VoIP phone or a regular phone (via an analog telephone adapter). You add contacts similarly to the way you do for instant messaging and then, to make a call, just click the icon next to the contact.

12.10 SUGGESTED READINGS

1. Adam, D.M.(1985). Computers and Teacher Training; A Practical Guide. New York: The Haworth Press Inc.
2. Behera, S.C.(1991). Educational Television Programmes. New Delhi: Deep and Deep Publications.
3. Das, R.C.(1993)Educational Technology; A basic Text. New Delhi: Sterling Publishers Private Limited.
4. Kumar, N. & Chandiram, J.(1967). Educational Television in India. New Delhi: Arya Book Depot Patel, I.J. et al. Handbook of Programmed Learning, CASE Baroda.
5. Ray, P.K.S (2006). Technology of Instructional Design, Part I. Delhi: Dominant Publishers and Distributers.
6. Ray, P.K.S (2012). Technology of Instructional Design, Part II. Delhi: Dominant Publishers and Distributers.

UNIT XIII E-LEARNING

Structure

13.1 Introduction

E-learning is a computer based educational tool or system that enables us to learn anywhere and at any time. Today e-learning is mostly delivered though the internet, although in the past it was delivered using a blend of computer-based methods like CD-ROM. Quite simply, e-learning is electronic learning, and typically this means using a computer to deliver part, or all of a course. E-Learning can be defined as 'learning facilitated and supported through the use of Information and Communication Technologies (ICTs)'. The term 'e- learning' therefore essentially covers the use of computers and technology as a vehicle for knowledge exchange within teaching and learning. E-learning refers to the use of information and communications technology (ICT) to enhance and/or support learning in tertiary education. E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used to describe this mode of teaching and learning. They include online learning, virtual learning, distributed learning, network and web based learning. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities. On closer scrutiny, however, it will be clear that these labels refer to slightly different educational processes and as such they cannot be used synonymously with the term e-learning.

13.1.1Concept

E-learning refers to a learning system that we can obtain through the internet using an electronic device. We also call it online learning or online education. The 'E' in E-learning stands for 'Electronic.' Hence, the original term 'electronic learning.'

The word 'online,' in this context, means with an Internet connection or via the Internet.

The term may also refer to a network that can provide knowledge and skills to one or more individuals. The network can provide the knowledge or skills either to everyone simultaneously or individually

13.1.2 Types of E- Learning

There are a few of the most common types of e-Learning. They are as given below;

a) Technology-Based Learning (TBL):

The phrase, interchangeable with e-learning, technology-based learning includes deployment of methods that use recent technological developments such as computer-mediated communication, videoconferencing, multimedia, groupware, video on demand, desktop publishing, intelligent tutoring system, virtual reality just to name a few.

b) Web-Based Training (WBT):

Generally as web-based learning, e-learning uses streaming media, text, and graphics to develop exciting learning environment that is deployed right on the user via the internet. It is a great way to learning for the large group of people scattered across the globe, but it can present the same deployment challenge that the audience encounters in dial-up connecting.

c) Computer-Based Training (CBT):

This is great alternative to WBT for graphic or audio rich e-learning, deployed via CD-ROM, which elements the streaming issues that can be associated with BT.

d) Synchronous and Asynchronous e-learning:

With synchronous e-learning, learning and teaching takes place at the same time while the trainer and learners are physically separated from each other. Examples of synchronous learning are as follows: Internet telephony, Web conferencing, online lectures, Distance learning via-interactive satellite and Audio/video conferencing. Asynchronous e-learning means that the user can take the training indent of any schedule.

At Resource Bridge it refers to this as "wherever they are whenever they need it," asynchronous e-learning does not need a facilitator or instructor, and is one of the more popular e learning deployment methods. Examples of asynchronous e learning are the following: Self-paced courses taken via internet on CD-ROM and Stored audio/video level presentations or seminars.

13.1.3 Advantages of e-learning

There are a number of benefits that are unique to the medium. Some of which are extracted here:

- Any time: A participant can access the learning programed at any time that is convenient - not just during the specific 1-3-hour period that is set for a conventional course. The episodes can be quick snatches at odd times or long late-night sessions. Cross-time-zone communication, difficult to arrange in real time, is as easy as talking to someone across town when using the Internet.

- Any place: The participants do not have to meet. That means they can be anywhere. International sharing is feasible. Individuals can log on at work, home, the library, in a community learning center or from their hotel when traveling.
- Asynchronous interaction: Unlike face-to-face or telephone conversations, electronic mail does not require participants to respond immediately. As a result, interactions can be more succinct and to-the-point, discussion can stay more on-track, and people can get a chance to craft their responses. This can lead to more thoughtful and creative conversations.
- Group collaboration: Electronic messaging creates new opportunities for groups to work together; creating shared electronic conversations that can be thoughtful and more permanent than voice conversations. Sometimes aided by on-line moderators, these net seminars can be powerful for learning and problem solving.
- New educational approaches: Many new options and learning strategies become economically feasible through online courses. For instance, the technology makes it feasible to utilize faculty anywhere in the world and to put together faculty teams that include master teachers, researchers, scientists, and experienced professional developers. Online courses also can provide unique opportunities for teachers to share innovations in their own work with the immediate support of electronic groups and expert faculty.

- Integration of computers: The online learner has access to a computer, so computer applications can be used without excluding some participants. This means, for instance, that a mathematical model implemented in a spreadsheet can easily be incorporated into a lesson and downloaded so all participants can run, explore, and refine the model and then share their findings and improvements

13.2 E-LEARNING, ITS TRENDS, ATTRIBUTES AND OPPORTUNITIES.

When it comes to education, the model has been pretty straight forward - up until the early ‘00s education was in a classroom of students with a teacher who led the process. Physical presence was a no-brainer, and any other type of learning was questionable at best. Then the computer evolution happened and it radically changed the learning landscape. In essence, e-learning is a computer based educational tool or system that enables you to learn anywhere and at any time. Today e-learning is mostly delivered though the internet, although in the past it was delivered using a blend of computer-based methods like CD-ROM. Technology has advanced so much that the geographical gap is bridged with the use of tools that make you feel as if you are inside the classroom. E-learning offers the ability to share material in all kinds of formats such as videos, slideshows, word documents and PDFs. Conducting webinars (live online classes) and communicating with professors via chat and message forums is also an option available to users. There is a plethora of different e-learning systems (otherwise known as Learning Management Systems, or LMSs for short) and methods, which allow for courses to be delivered. With the right tool various processes can be automated such as the marking of tests or the creation of engaging content. E-learning provides the learners with the ability to fit learning around their lifestyles, effectively allowing even the busiest person to further a career and gain new qualifications. Some of the most important developments in education have happened since the launch of the internet. These days learners are well versed in the use of smartphones, text messaging and using the internet so participating in and running an online course has become a simple affair. Message boards, social media and various other means of online communication allow learners to keep in touch and discuss course related matters, whilst providing for a sense of community. In the fast-paced world of e-learning the available technologies to make a course exciting are always changing, and course content can and should be updated quickly to give students the very latest information. This is especially important if the elearning training is being given to employees in a sector where keeping up-to-date on industry developments is of the utmost importance. This is one of the reasons why many businesses are now offering training via elearning - other reasons includes low costs and the ability for employees to study in their own time and place. Overall, traditional learning is expensive, takes a long time and the results can vary. E-learning offers an alternative that is faster, cheaper and potentially better.

13.2.1 Management and implementation of e-learning

LMS stands for Learning Management System and it's a global term for a computer system specifically developed for managing online courses, distributing course materials and allowing collaboration between students and teachers. A LMS will allow you to manage every aspect of a course, from the registration of students to the storing of test results, as well as allowing you to accept assignments digitally and keep in touch with your students. In essence, the LMS is the backbone of most e-learning activities. LMSs are built on various platforms, commonly PHP, .Net or Java and they will hook up to a database such as 35 PostgreSQL, MySQL or SQL Server. There are many LMSs out there, both commercial and open source. In a corporate environment such a system can be used to monitor staff, and keep records of appraisals and training. Whether your course is run for a few learners over a long period of time, or for many over a shorter period, a Learning Management System makes your life easier and helps your course run smoothly. A good LMS will also have a reporting system so you can access information that would be tricky to gather yourself. LMSs do vary in the features they offer, but most systems are likely to have some or all of the following features: Easy GUI GUI stands for Graphical User Interface. Most LMSs offer customization options for the interface to allow the user to give a unique flavor to his learning platform. Although the GUI is there to make the environment more aesthetically pleasing, it's also meant to be functional. Customization 36 Aside from the GUI an LMS will oftentimes offer several different options for customization to tailor the system to your needs. Language options, notification settings and other important features can be changed to suit the way you want your LMS to work for you. This is great because one LMS can be used by many different types of users, each with unique preferences. Enrollment The system may allow students to enroll online and keep track of their details, course progress and test results for you. It may also allow students to pay their course fees online via credit card, debit card or PayPal. Virtual Classroom Your LMS may integrate with whiteboard systems for virtual classroom sessions and help you to schedule sessions too. It may offer you the ability to send out invites or reminders for classroom sessions and integrate with an online calendar system or with Outlook. Social Networking 37 An LMS may be able to integrate with social media so you can share your content or news items via Twitter or Facebook etc. at the click of a button. Communication Your LMS system should also have built in functionality for communicating with your students, such as sending out a bulk email to everyone on a particular course, to individual students or to students studying a particular pathway. You should also be able to schedule automatic emails which can be very useful for notifying students of an upcoming test or virtual classroom session. A LMS may provide you with a chat room or a forum that you and your students can use. Course pathways With your LMS you should also be able to specify the details of a course with a flexible work flow to set students on certain 'learning pathways'. Reports Any good LMS will have a reporting system you can tap into, generating reports that you can export into Excel, and also offering you graphical representation of your data for ease of understanding. 38 Help with content creation Being user-friendly is more than just a phrase. It's an action. When entering into your LMS for the first time it's good to have at least a sample of a course to get you going. An example of how to upload, manage, and distribute content within the system can go a long way with a new user. Templates are also good at getting new users going. Testing Tests are an important part of many online courses and most LMSs will have plenty of functionality related to this. You'll want a robust test

environment with various types of tests available to you and some built-in templates to use as a starting point. It's likely that you'll have the ability to randomize test questions and set a time limit for tests. With the test environment being within your LMS, you should also be able to rely on the security of your system. Test results will be stored and available to you within the reporting area of your LMS. You should also be able to set up a multiple choice test to be self-grading and choose to have the results delivered just to you, or perhaps also displayed instantly on-screen for your students. 39 Types of learning.

13.3 E-Book and E-Magazine, Electronic Journals and E-Readers, E-Coaching, E-Tutorial and E-Moderation

What is e-Book?

According to Looney & Sheehan (2001, p.38) eBooks can be defined as a tool specialized for displaying electronic reading material or software designed to display such material. It can include different types of content such as short stories, plays, research reports, manuals, textbooks, speeches, white papers, course packs, and distance learning materials. From the article "About eBooks" (n.d.), eBook is considered as book which is available in digital format and provides an alternate reading choice for lovers of technology.

e-Books in education

eBooks have become very popular nowadays especially in the education field. There are lots of advantages of using eBooks in schools and among the students and teacher. Looney & Sheehan (2001, p.38) stated that eBooks can be printed, loaned, or given away to others with the permission of the publisher or the author. This is good for the students as lots of materials are needed in every teaching where it can help teachers by supporting their lessons. Teachers can easily print the material from the eBooks and distribute it to their students and there is no need for teachers to buy the exact book and do the photocopy.

Secondly, the use of eBooks is also very economical not only for teachers, but for the students as well. Students would not have to buy the real book which can cost them a fortune, and just buy the exact book from the eBooks which costs much less than the exact price. For example a 30 pounds book would only be 2-4 pounds if students buy the electronic version of the book. This would save a lot of money and more books can be purchased by them. The content would be the same and students would get the same benefit as buying the real book. All of the textbooks used in school would be no longer necessary as students can easily get access through it by using eBooks. This would help the school in reducing the money spent on books. eBook is also small and mobile, thus students can get access to those books whenever and wherever they are for example in the library, off-campus, at home, in the restaurants, etc.

Furthermore, eBook can also function way better than the real book. From having the same content, graphics, layout, and illustrations as the printed book, it also has the text to speech and other text- to- speech and other audio options which is very beneficial for vision impaired students or for

international students who are struggling in learning English (Looney & Sheehan, 2001). For the vision impaired students, they would just have to listen to the audio in order to understand what the text is all about without having to put much effort in reading the text. The text can also be zoomed in thus it would make the font size bigger and would help students to read the text better. As for those who are learning English, the audio would help them in learning about the correct pronunciation of English. Foreign materials are easily accessible and international students can make full use of it in improving their level of English The dictionary included in the eBooks is also very helpful for them as students can easily find the meaning of the word in the eBook. A lot of embedded media are provided in the eBooks such as animations, audio, video, links to the Web, and links to other related eBooks (Looney & Sheehan, 2001). These would develop the students' imagination and interest, and also are very helpful in explaining the lesson to students who work best by using the visual and auditory ways.

In conclusion, with thousand of books that can be accessed through eBook, we can say that eBook is a very successful device that can be used in education especially for students where they can purchase the electronic book with a very cheap price and all of the books can be accesses just with the tip of their fingers only. Less money would be spent and less time would be taken in searching for all the materials needed. Schools should be encouraged to provide eBooks for the students as it give a lot of benefits to each and every one of them. This device is very convenient, practical, and flexible for everyone.

ICT magazines follow up to date news, especially pertaining to ICT business. Also it offers ICT development news, product market advice, and in-depth coverage on major businesses and business events. In addition to digital economy and business, the magazines also delve into the world digital economy movements, providing specific information on the various digital transformations from countries throughout the world. IT magazines currently cover everything important to digital Bangladesh, from ICT innovation to implementation, ICT utilization to security, both at home and abroad. Computer Jagat (1991) then the Computer Bichitra are the oldest magazines of Bangladesh. Afterwards in 1996 The PCWorld Bangladesh. The magazines have everything you want. Amusing as well as inspirational tales, news reports, articles on a wide range of things, interviews and discussions with many people of ICT sectors not only the leaders. Young people used to learn computer by reading such magazine once. As internet penetration in Bangladesh is a recent activity.

E-journals

E-journals With the advent of the internet, researchers and academics have recognized the capabilities of the information and communication technologies as efficient means to share results and to get around barriers by full transfer of intellectual property rights from the author to the publisher; it is also a means of improving the slow turn-over of traditional publishing (Correia and Neto, 2006). An electronic journal is a periodical publication which is published in electronic format, usually on the Internet. It is useful in higher education. According to Rowley (2006) electronic journals take two different forms: journals that

are published in print form, available in digital form and electronic journals which do not necessarily need a publisher, and which can be managed by an editor and the scholarly community. Both types may have a significant impact on scholarly communication and in the way knowledge is created and disseminated.

Bringing technology into classrooms has had a positive impact on the quality of education delivered. Students and teachers unanimously agree upon the benefits of using eBooks in education.

The aim of eBooks is to simplify and enhance the overall learning experience. Digital Books make the learning process more interactive and engaging.

Instead of listening to one person continuously talking, students can now actively participate in the learning process. Integrating eBooks into classroom teaching makes learning a fun and engaging experience. Gone are the days when students had to carry a bag full of books every day to classrooms and back home.

With eBooks entering the educational domain, one device is enough to include the entire year's syllabus. These digital books can be introduced to students at a very young age, right from kindergarten to university level, ensuring that learning never becomes boring for them.

An effective learning system must ensure that students are actively involved in the learning process. eBooks have brought about an educational reform which helps students to learn better and faster.

Listed below are some of the benefits of introducing e-Books in education:

1**. Study Anywhere and Anytime:**

An eBook is easy to carry around. Instead of carrying a bag full of books, it is easier to carry a mobile device that supports eBooks. Most students these days always carry a mobile-based device. It could be a smart phone, a tablet or a laptop. The portability of an eBook allows students to refer to their notes and course materials anytime they want. Instead of carrying multiple books, students can now have everything in one place.

2**. Offline Access to eBooks:**

Over 50% of the world's population has access to the Internet. Yet we all sometimes have trouble with connectivity and network issues. In order to ensure that the Internet connection does not hamper the learning process mobile devices, these days, offer offline services. Students can now download any content they want and save it on their device and go through them later at their convenience.

3. **Multiple Interactive Features:**

eBooks are not just plain reading materials, they have all the right tools to help students make notes and highlight content. eBook reading devices

have a lot of interactive features, like annotations, pen tools, page zoom, search option, read aloud etc. The search tool is the most favored tool because of its ability to find words and topics in an instant.

The search tool avoids the time-consuming process of turning pages after pages to find a particular topic or phrase. They can bookmark pages and chapters. The online dictionary helps them to quickly find meanings of words. Besides, the user can also change the font size and style and adjust the brightness of the device as per what suits their eyes. An eBook is an all-in-one device which provides a wholesome learning experience to students.

4**. Edutainment Value:**

The course content doesn't have to be only text. You can include music, animations, videos and audio explanations into the learning module. Videos make the learning process more interesting. Students can pause and rewind the video and watch it again. Animations are fun and entertaining and have more retention value.

Watching video content aids in retaining information far better than reading the same stuff. Many publishers are now incorporating videos into their eBooks to keep the students engaged in the course material. Videos and animations add an entertainment value while being informative at the same time. It helps improve their ability to learn and recollect information.

5. **Experiment with Augmented Reality:**

Augmented Reality is transforming the learning space at an incremental pace. Bringing AR into eBooks provides an immersive learning experience to the students. AR can transform any normal image into an enhanced 3D image, which the students can view from all angles.

They just need to point their AR app-enabled device at the image or object, and a computer-generated visual pops up on their screen. This 3D image helps provide students with an immersive and compelling learning experience. Students would find these enhanced visuals more interesting over flat diagrams. It can also have links to relevant external sites, where they can find more information about the projected image.

6. **Save Printing Costs:**

eBooks do not require paper. Authors can submit their work in a PDF format, which can be converted into electronic books. Paper does not come into the picture. So, it saves all your printing related costs, right from purchasing printing paper, designing the layouts and hardcover etc. It even saves the environment by eliminating the need for printing.

Millions of trees are cut down each year to produce paper. Add to that the transportation costs, paper making costs, and all the carbon footprint it leaves behind. All this can be avoided if you switch to eBooks. This is

also the reason why eBooks in education can be the best alternative than its counterpart printed books.

7. **Provide Updated Content to Students:**

In traditional paperback books, if there's some updated information that needs to be included in the syllabus, you'd probably have to reprint new books. But with eBooks, all the learning material is stored on the cloud.

This means, eBooks can be updated anytime you want, and it will be reflected in all eBooks. So, you can always ensure that your students have up-to-date information with them at all times. This again saves your reprinting costs.

8. **Interactive Assessments:**

eBooks include self-assessments for students to test their knowledge. It does away with the traditional style of giving a quiz at the end of the chapter. eBooks are embedded with quizzes and exercises throughout the chapter and also after the chapter ends, to ensure that students retain the information that they are reading.

It helps measure whether the student has understood the concepts properly. eBook assessments can provide instant results, so students can immediately view the test results. Not just students, the teacher can also view test results and provide immediate feedback.

The introduction of eBooks in education has optimized the learning experience. It has turned learning into a fun and engaging event. Students no longer dread having to carry a load of books and sit through hours of lectures paying only half attention to what is being taught.

eBooks ensure that students are proactively interacting with the learning material by way of videos, animations, augmented reality, changing displays, taking notes etc. Digital books provide students with a completely enriched learning experience and help them improve their academic performance.

E-Readers

E-readers like the Amazon Kindle and the Barnes and Noble Nook are beginning to make their way into school libraries and classrooms. It's about time.

E-readers have tremendous potential to entice reluctant readers to read more. A study that we recently conducted among low-reading-ability middle school students demonstrated that potential. Students in 6th, 7th, and 8th grades became more engaged and motivated during their scheduled silent sustained reading periods when they were given the opportunity to use e-readers.

The study took place in two reading improvement classes in Rivercrest Middle School in the urban metroplex of Dallas-Fort Worth. A total of 199 students—most of whom were reluctant to pick up books and saw little

value in reading—were given the option to use Kindle e-readers during their scheduled sustained silent reading time. In both classes, students could choose to read printed text, but the majority of them chose to use the e-readers.

The devices were loaded with 25 books, including classics like The Wizard of Oz and Black Beauty and ghost stories and scary stories like Forever Neverland and They're Coming for You: Scary Stories That Scream to Be Read. Some students read the classic novels, but the ghost stories and scary stories proved to be more popular. After two months, most of the students reported that they had read one to four books during the sustained silent reading period.

Benefits of E-Readers

Motivation

Engagement is the key to successful reading and learning. In fact, time spent in engaged reading is "the best predictor of measures of reading achievement, reading comprehension, vocabulary, and reading speed, including gains in reading comprehension between 2nd and 5th grade" (Anderson, Fielding, & Wilson, 1988, p. 285).

In our study, pre- and post-assessments using the Motivation to Read Profile (tested by Gambrell, Palmer, Codling, & Mazzoni, 1996) found significant gains in students' attitudes about the value of reading and their view of themselves as readers, especially among the boys. Our follow-up interviews shed light on this phenomenon.

One boy said he liked the e-reader because the book he was reading was always available—he didn't have to worry about someone else reading it or taking it out of the classroom. Another boy pointed out that the e-reader enabled him to read what he wanted without carrying around a lot of books.

We recognize that the novelty of a new gadget—especially a technology gadget—plays an important role in motivation. Certainly, the reluctant readers at Rivercrest Middle School were motivated to read partly because their classrooms had been specifically chosen for the e-reader experiment. With such enthusiasm, we were not surprised that students easily learned to manage the e-reader and its features. They quickly figured out how to adjust the font size, choose horizontal or vertical orientations, and play with the voice-to-text features. They learned how to bookmark their places and how to locate unknown words with the dictionary feature. Their interest in the new technology motivated many students to explore first and then settle into reading.

Easy Response to Text

Responding to text is one way that students establish comprehension and improve their skill in understanding, predicting, and critically analyzing what they read. Larson (2009, 2010) observed students spontaneously using the highlight feature of the Kindle called "My Clippings" to leave personal notes and questions about what they were reading. She concluded that such features

were a valuable way for middle school students to demonstrate the reflection that must accompany meaningful reading.

Rather than write responses in spiral notebooks, students can leave a trail of responses on their e-readers. The response-to-text feature allows the reader to position the cursor at a desired entry point, type a personal note, and save the response. Once the responses are saved, students can share them with peers and teachers, and they can also see what other readers have written in response to the same section of text. They can even use the response-to-text feature as their own personal reference for writing a paper. To take full advantage of the power of e-readers to encourage student response to text, we recommend providing one e-reader for each student.

Extra Support for English Language Learners

English language learners and other students who read below grade level can improve their reading skills when they have opportunities to practice on lower-level texts (Kelley & Clausen-Grace, 2009). For middle school students, however, reading lower-level texts may be embarrassing, and the fear of what their fellow students will think may discourage them from reading.

E-readers enable teachers to provide appropriate texts to struggling middle school readers privately. The teacher can upload and assign easier-to-read texts, perhaps supplemented with some free-choice texts. Classmates need not be aware of what others are reading.

Voice-to-text is another feature of the e-reader that can support English language learners. Most of the students in our study were not fond of the voice-to-text feature because of the nature of the voice, which they found robotic. Two of the English language learners, however, brought their earphones so that they could listen to sections of their e-books. This feature seemed to help them gain confidence in English reading and speaking. With continuing improvements in technology, we expect that the voice-to-text feature will improve with newer editions of e-readers.

Increased Confidence with Technology

As technology tools like e-readers and e-books become more integrated into our lives, facility with such devices will be an increasingly important part of literacy learning. Today's students must learn how to use such tools, as well as to critically evaluate how technologies can aid or possibly hinder their learning. Many of the students at the middle school in our study came from low-income families, and their home use of technology was limited. This was all the more reason to give them ample opportunities at school to learn about, use, and evaluate technologies such as computers, flip cameras, video-making software, and e-readers.

Economic Advantages

Including e-readers and e-books in school and library budgets may reduce the amount of money spent on hard-copy texts and materials. Additional

cost savings may come from reduced replacement costs for lost or damaged hard-copy texts.

However, we are not advocating e-readers and e-books as cost-saving measures. In fact, we hope that school administrators plan for sizable start-up costs that enable every student in reading improvement classes to have his or her own e-reader, rather than share with others in the class or school. We suggest that administrators, librarians, and teachers think of the e-reader as one more important tool to help middle school students succeed at reading.

Students See the Benefits

Educators' reasons for using e-readers in middle school—enhancing student enjoyment and motivation, providing additional support for struggling students and English language learners, and so on—make good sense. But the reasons that middle school readers give for reading with e-readers are perhaps more powerful. After two months of using the e-readers, students in our study said,

- The e-reader has very good books.
- It's cool because it's like a computer.
- I like the dictionary.
- It is easy to use.
- It helps me read faster.
- I like to read more now because the stories are interesting to me.
- I better understand what I read.

It appears that struggling readers in middle school understand what they need for success in reading. They know that engagement is what it takes to become a better reader, and technology may hold the key to such engagement.

E-Coaching

An online education is preferred by individuals who may not be able to make it for classes in a traditional brick and mortar kind of college due to various reasons. Below we'll examine some of the benefits this exciting education provides to such students.

Benefits of Online Education

1. Flexibility

Students have the freedom to juggle their careers and school because they aren't tied down to a fixed schedule. In a traditional classroom setting, class meeting times are set, and the student has no power over this, forcing them to work their schedules around these dates. Most people who choose online

learning tend to have other commitments, and prefer this mode of learning as it gives them power over how they will delegate their time towards their different projects.

2. Reduced Costs

Online education can cost less due to a variety of reasons. For example, there is no cost for commuting. Assorted costs that are related to transport, such as fuel, parking, car maintenance, and public transportation costs don't affect the online student.

3. Networking Opportunities

Online education also provides students with the chance to network with peers across nations or even different continents. This often leads to other opportunities in terms of collaboration with other individuals in the implementation of a project. At the same time, it makes them culturally sensitive and able to fit into other environments easily given their exposure to other cultures.

4. Documentation

All the information that you will need will be safely stored in an online database. This includes things like live discussion documents, training materials and emails. This means that if there's ever anything that needs to be clarified, the student will be able to access these documents fast, saving valuable time. This is especially useful for individuals that need to carry out research for a project and submit their findings to a panel.

5. Increased Instructor - Student Time

Students in traditional classrooms may not get the personalized attention they need to have concepts clarified. Although class sizes are small at CCA, most colleges have classes of students that number in the hundreds. This is not a problem for this type of education because online guided discussions and personal talk time with their professors and lecturers is a hallmark of online classes. This increases the chances of a student performing well due to the time their instructors give them. This also enhances their problem-solving and communication skills, as well as knowing how to defend their arguments to superiors if needed.

6. Access to Expertise

An online college education might give students access to specialized degree courses that may not be available in an easily accessible or local institution of learning. For example, at CCA you can pursue a degree in Marketing or a certificate in C++ Programming without having to live near the institution. Online classes allow the sharing of expertise that helps more people have access to education that is not readily available in certain geographic locations.

This type of education has grown over the last few years and has experienced mainstream acceptance. With an online class, you get to

control your learning environment, which ultimately helps you develop a deeper understanding of your degree course. New models of learning are always springing up in the market, providing students with varied opportunities to fashion their education into something that fits them, not the other way round. It also provides individuals an opportunity to finish a degree they might have started and were unable to continue with for one reason or another. The future of online degree education looks promising, and opens up education to a larger section of the population than ever before.

Online learning is a method of delivering educational information via the internet instead of in a physical classroom. Online learning is education that takes place over the Internet. It is often referred to as "e-Learning" among other terms. However, online learning is just one type of "distance learning". The umbrella term for any learning that takes place across distance and not in a traditional classroom. Distance learning has a long history and there are several types available today, including:

- Correspondence Courses: conducted through regular mail with little interaction.
- Telecourses: where content is delivered via radio or television broadcast.
- CD-ROM Courses: where the student interacts with static computer content.
- Online Learning: Internet-based courses offered synchronously and/or asynchronously.
- Mobile Learning: by means of devices such as cellular phones, PDAs and digital audio players (iPods, MP3players).

Some of main advantages of online learning include:

- Convenience: 24/7 access from any online computer; accommodates busy schedules; no commuting, no searching for parking.
- Enhanced Learning: Research shows increased depth of understanding and retention of course content; more meaningful discussions; emphasis on writing skills, technology skills, and life skills like time management, independence, and self- discipline.
- Leveling of the Playing Field: Students can take more

time to think and reflect before communicating; shy students tend to thrive online; anonymity of the online environment.

- Interaction: Increased student-to-teacher and student-to-student interaction and discussion; a more student-centered learning environment; less passive listening and more active learning; a greater sense of connectedness, synergy.
- Innovative Teaching: Student-centered approaches; increased variety and creativity of learning activities; address different learning styles; changes and improvements can translate to on-ground courses as well.
- Improved Administration: Time to examine student work more thoroughly; ability to document and record online interactions; ability to manage grading online.
- Savings: Accommodate more students; increased student satisfaction = higher retention and fewer repeats.
- Maximize Physical Resources: Lessen demand on limited campus infrastructure; decrease congestion on campus and parking lots.
- Outreach: Give students options; reach new student markets; appeal to current students thus increasing enrollments.

E-Tutorial

An E-tutor (or an automated tutor) as a software tool that offers "students guidance in undertaking specific tasks" (Albert & Thomas, 2000, p. 141). Curilem, Barbosa and Azevedo (2007) determined three different approaches to e-tutor design; the first approach uses the e-tutor as a guide where the software has control of the lesson; the second approach has the student in control of where the lesson will lead, and the third approach has a mixture of the first two, where the system will determine the level of intervention based on student responses (p. 548).

Some tutorials will simply guide the user through a set a resources to help complete a specific assignment (Albert & Thomas, 2000). Resources such as videos are becoming a popular resource in these tutorial programs (van der Meij & van der Meij, 2014). Other e-tutors can be much more complex and interactive. Many e-tutors are interactive, can adjust for skill

level, and will offer random content to challenge the learner (Adams, Yin, Vargas, Luis, & Mullen, 2014). Other programs will offer "scaffolding", which attempts to mimic a human tutor by assisting the learner (Albert & Thomas, 2000, p.143). This assistance can be enhanced by smart 'learning' e-tutors, that build on previous data to improve suggestions in the future (Barnes & Stamper, 2010, p.11). Whetstone, Clark, and Flake (2014) noted that e-tutors are often used to assist a human teacher to adjust their instruction based on the data collected by the e-tutor.

13.4 E-moderate

E-moderating is a process of engaging learners in a discussion, initially facilitating the discussion and then taking a step back to allow students to drive the ongoing discussion and construct new knowledge. An important element of e-moderating is the role of the online facilitator who is known as an e-moderator. The role of the e-moderator is an important one as it can impact on the quality of learning achieved by students and is pivotal for effective online discussions. Gilly Salmon (2000, p.25-26), developed a five step model which outlines the steps or learning platforms required to effectively foster online student engagement and learning in the realms of communication and collaboration through the use of Discussion Boards. Each stage builds upon the other, where stages three – five are the most productive and constructive for learning and teaching. The steps are outlined and briefly explained below.

Step 1: Access and motivation -students require individual access and the skills to use the communication tools.

Step 2: Online socialisation - students create an identity online and finding others with whom to interact.

Step 3: Information exchange - students give information relevant to the course to each other. Up to and including stage three, a form of co-operation occurs, that is, support for each other's goals.

Step 4: Knowledge construction - course related group discussion takes place and interaction becomes more collaborative. Communication is dependent upon common understandings.

Step 5: Development - students look for benefits from the system that will help them achieve their goals and explore how to integrate their online discussions into other forms of learning and reflect on their learning processes. Each stage requires students to master certain technical skills (shown in the bottom left of each step). Each stage calls for different e-moderating skills (shown on the right top of each step). The "interactivity bar"

running along the right of the flight of steps suggests the intensity of interactivity that you can expect between the students at each stage. At first, at stage one, they interact only with one or two others. After stage two, the numbers of others with whom they interact, and the frequency, gradually increases, although stage five often results in a return to more individual pursuits.

Learning styles and approaches Diversity of teaching styles can add an extra dimension to e-moderating as it allows e-moderators to develop a rich variety of computer mediated communication techniques in line with their own strengths, beliefs and context requirements. In conjunction with Salmon's 5 step model, other learning style considerations and approaches are outlined below to assist e-moderators in achieving higher student participation rates, along with elevated student satisfaction. Why Share? There are two motives for groups of people to work together. One is self-interest and the other common interest. The first can be promoted through extrinsic factors, such as incentives, but the second needs trust and mutual respect. So from the start e-moderators should seek a climate of strong enhancement of the well-being of the online group, based on respect and support for each other rather than corner cutting in the service of instrumental personal goals. In this way, intrinsic motivators will gradually emerge and learning be promoted. Some e-moderators assume that varying cultural backgrounds and experiences from students result in very different approaches to learning and try to adapt their e-moderating accordingly. But it is extremely difficult to get to know and understand someone else's culture and attempts to do this can result in unhelpful stereotypical views. Instead it's best to promote interest and respect for the backgrounds of all students. The nature and support of the learning environment is just as important as students' cultural backgrounds. Avoid simplistic views of cultural influence in online learning as students are very adaptable and able to respond to challenges as they draw upon their cultural experiences and perspectives. Research supports exploring feelings along with reflection (Taylor 2001). Transformations happen through reflection but also through experiencing and feelings, thoughts and actions. In other words e-moderators should try and promote emotional literacy as much as information technology literacy! (Taylor 2001). Managing Time The use and experience of time is a major aspect of successful e-tivities. Time takes on a new dimension online. Working asynchronously involves a radical rethink - not only of learning or teaching time, but also of other aspects of life. How often are you going to log in and check your student's discussion messages? This would be relevant for students as well as the e-moderator. Guidelines to students could be the answer so students know how often you will be in the discussion and you can also advise students how often you expect them to be in. If you have weekly discussion topics you could set them up with regular tasks to be done, e.g. by Wednesday each week you must have posted what you currently know about the topic, by Friday of the same week you must summarise what information has been shared. And remember once again that 'overfilling' an e-tivity is the enemy of active engagement online. If you provide lots and lots of resources, your students

will use them and have little time for each other. Using clear start and finish times by the calendar enables synchronisation and co-ordination of group activities. Such pacing needs to appear in the e-tivities because students will not meet often 'by chance' online to co-ordinate for themselves. Students and their e-moderators will experience time in all sorts of ways when working online. One key aspect is the complexity associated with a synchronicity. For example, students log on from around the globe and the site is always open. Students take part according to their individual work patterns and locations.

13.5 The E-Journals in the field of Educational Technology

Information and Communication Technology (ICT) can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. The Internet offers a world of information in one place. It is a helpful tool in communicating and researching all different subjects. It is also a great way for students to use computers with proper supervision. Yet using the Internet in an educational system can be controversial. Some of the disadvantages include students giving out too much information about themselves, sites too commercialized with little educational value, and access to material that parents might not want their children exposed to. However, teachers and students have seen many benefits.

Thus through your study of this unit, you have learnt about the basics of internet, email and search engines. And also you have opportunity to learn about e-learning, m- learning, virtual learning and online learning. You have also understood certain advanced educational technology concepts like e-leaning, m-learning, virtual learning, smart classroom, online learning, Wikipedia, MOOC and social networking.

13.6 Ethical Issues in Educational Technology

Ethical issues in Education Technology involves several different aspects, including proper "netiquette", student safety and privacy, unauthorized access at school, and objectionable materials showing up at school. This is an important responsibility for teachers in the classroom that use technology in the classroom. As teachers are encouraged to use technology in the classroom, cyber ethics should also be a part of the curriculum. Jerry Crystal states, "Educators do need to address cyber ethic, but they can address it in the context of their current curriculum and incorporate the lessons into ongoing programs." (as cited in Starr, 2003, n.p.) Proper network etiquette or "netiquette" is a necessary skill for all people. Children are taught to respect adults, be courteous to everyone, never say anything mean, and other life skills from the time they were begin to speak. Cyber ethics should be viewed with the same skills. Shea (n.d.) has listed 10 core rules to proper netiquette. Because most people use a computer to communicate, the first rule states to remember that there is a human being with feelings on the receiving end of your communication. Secondly, remember that you have to follow the law in person and on the Internet. The third rule of proper "netiquette" recommends that you look around the site before you say anything so that you do not say anything improper. The fourth rule talks about sending the right information to the

right people. The fifth rule is important because it explains that you should know what you are talking and to express yourself with using proper grammar and vocabulary. Sixth, share your expertise with others. The seventh rule denotes that you should not continually send angry letters and notes about the same thing to the same people. Rules eight and nine have to do with privacy. Respect other people's privacy. The tenth rule has to do with being nice about correcting people. These skills are important to all people. Being a teacher, it is important to convey to students the importance of knowing these skills. Crystal states, "Above all, don't separate the online world and the offline world. Try to blend them together. It's the same world online and off. Just because there's a sense of anonymity online doesn't mean the rules change." (as cited in Starr, 2003, n.p.) The younger students learn about these rules, the better. They are already learning it as "life skills", now these skills can be transferred to their online communities. Student safety and privacy is another important aspect of cyber ethics that teachers are responsible for in the classroom. Williard (2006) states, "The Children's Internet Protection Act requires that school districts develop an Internet safety plan addressing the unauthorized disclosure, use, and dissemination of personal identification information regarding minors. School districts need to consider a variety of issues as they attempt to comply with this safety plan requirement." The Virginia Department of Education (n.d.) states, "The high-speed Internet has made the Web much more interactive, with communication possibilities expanded beyond the written word. While young people tend to adopt new technologies more quickly than adults, many do not have the experience or knowledge to understand the potential risks. Parents, educators, and community members must encourage students to take advantage of the Internet's benefits while reducing its risks." As a parent, I would expect teachers to keep my child safe from dangerous or risky situations. I also understand the benefit of students being able to communicate with students from other countries and exchanging cultural and traditional information. It is the responsibility of the teacher and the parents to teach and model safe online communication with others. The younger the students begin learning about appropriate online behavior the better. Reminding students regularly helps reinforce the idea that these rules are in place for their safety. The Virginia Department of Education (n.d.) states that "students must understand that people are not always who they say they are. They should never give out personal information without an adult's permission, especially if it conveys where they can be found at a particular time. They should understand that predators are always present on the Internet. Students should recognize the various forms of cyberbullying and know what steps to take if confronted with that behavior." Peter Gulotta recommends, Establish a good relationship with kids. The kids who are most vulnerable to online predators are those who are already troubled and who don't have a good relationship with a trusted adult. Control the online environment. Don't allow kids to use a screen profile or provide personal information online. Predators will put a kid on a buddy list, look for the child whenever he or she is online, gradually become a confidant, and eventually start talking about sexual topics. Be frank about what's out there. No one knows you're a dog when you're on the Internet and there are a lot of people out there with terrible intentions. Kids need to know that. Do not post student photos on the Internet. It's tantamount to putting personal information online. "We're not

saying your child is going to be hurt if his or her picture is on the Internet. We're saying they could be. Know what the parameters are; know what these people are doing; and then make your own decisions. (as cited in Starr, 2000, n.p.) Cyberbullying is a new term that involves the safety of students in the digital world. "Cyberbullying" is when a child, preteen or teen is tormented, threatened, harassed, humiliated, embarrassed or otherwise targeted by another child, preteen or teen using the Internet, interactive and digital technologies or mobile phones.” (Stop Cyberbullying, n.d.) The safety of our students is the teacher’s goal. Crystal (2003) believes that "if we provide positive images and effectively communicate ethical values in all areas of their lives, those values will be reflected in the technological environment as well. How we teach kids to view themselves and their use of technology at this level is what they will carry with them into adulthood," (as cited in Starr, 2003, n.p.) Another important aspect of ethical issues of technology in the classroom is the unauthorized access to certain websites at school, downloading unauthorized software or games, and downloading music or movies illegally. This is another part of trying to keep students safe while they are online. According to Crystal, “the most common problem isn't hacking (illegally accessing Web sites) or cracking (vandalizing Web sites); It's the unauthorized downloading of games and software.” (as cited in Starr, 2003, n.p.) It is amazing to me when students confide that they can get around the firewalls at the school to get different social networks. These students know that it wrong. These students also know that there are consequences to these acts, but they still do it. I have heard of students gaining access to the school files. These students know they are committing a crime, but they think it is funny and that nothing bad is going to happen to them. Students also know that downloading current music and movies is illegal, but they still do it. Recently, I know that students don’t have to use a computer at school to get to these types of websites. They have begun to use the Internet on their cell phones. So, what’s the answer? Crystal answers that they deal with those cases by making students aware that how technology is used is as much an ethical issue as hacking or cracking. "If everyone does whatever they want on a network, it uses up a ton of space and interferes with other users. ... If they download a virus along with the software, they risk destroying the entire system -- incurring a tremendous financial loss." (as cited in Starr, 2003, n.p.) Students need to think about what they do and who they are affecting when committing these actions. By making students accountable for their actions, they are learning to be responsible cyber citizens. One answer is having students and parents sign an acceptable use policy that was created by the school district to make students responsible and aware of behaviors and consequences. To make it even more concise, I believe all teachers should their own acceptable use policy to use in their own classroom as well as the school district. Students can contribute to the rules and consequences of the policy making them co-creators of the policy. Students should also be reminded and warned about their online behaviors and what is appropriate and inappropriate while working on the school computers. In this way, they know what to expect and what happens when considering unauthorized access. Objectionable material is another part of cyber ethics in the classroom. I have heard a story of a group of boys who were able to gain access to a computer room where they searched for x-rated material on the computer and ended up broadcasting it to the entire school through the

televisions. At my school, there were incidents of students having pictures of x-rated materials that were printed on school computers. Starr (2000) cites a study conducted for The National Center for Missing and Exploited Children (NCMEC) that found that one in four regular Internet users younger than 17 was exposed to unwanted sexually oriented pictures online during the past year. (n.p.) NCMEC recommends that teachers talk specifically to students about the diversity of online dangers, including threats from youthful and female offenders, make students and parents aware of the existence and locations of resources for reporting and dealing with Internet offenses, develop different prevention and intervention strategies for youth of different ages, and encourage young people to take responsibility for youth-oriented parts of the Internet and to help clean up standards of Internet behavior. (as cited in Starr, 2000, n.p.) Students and parents need to know that this type of curiosity and searching, whether at school or at home, can lead to even more dangerous behavior such as meeting sexual predators or can lead to sexual harassment. Again, I will mention that teachers can include the prohibition of searching for these sites on their acceptable use policy as well as keeping a close eye on student access to computers. Ultimately, I believe students and parents need to be made aware of all the dangers in cyberspace. A collaboration of teaching proper online etiquette and behavior between teachers and parents is where it needs to begin. Teachers can lecture and warn students of online dangers, but these students also have access to computers at home, or at friend's homes, or even on their cell phones. Crystal discusses that schools should, "develop a detailed universal plan for technology use and lay it out for everyone at once. Hold training sessions for parents and kids together. Show videos and discuss the issues. Make it clear to everyone that the ethical rules they live by also apply to technology." (as cited in Starr, 2003, n.p.) The first step is that all teachers should develop an appropriate acceptable use policy for their classroom use of computers. Students can be invited to contribute their ideas and rules. Teachers can also forward these to parents for review and input before a last copy is created. These policies will give students more freedom and responsibility when using computers in school and home. Teachers can also regularly review this policy with students, just in case they forget what appropriate and inappropriate online behavior involves. I think this would make it perfectly clear what student expectations are and they are able to focus on the assignments.

Check Your Progress

Notes: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of the unit.

1. What are the Advantages of e-learning

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2.Define Group collaboration

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13.7 LET US SUM UP

In this unit you have learnt the concept of E-Learning

13.8 UNIT- END- EXERCISES

1. Define Types of E- Learning

13.9 ANSWER TO CHECK YOUR PROGRESS

There are a few of the most common types of e-Learning. They are as given below;

e) **Technology-Based Learning (TBL):**

The phrase, interchangeable with e-learning, technology-based learning includes deployment of methods that use recent technological developments such as computer-mediated communication, videoconferencing, multimedia, groupware, video on demand, desktop publishing, intelligent tutoring system, virtual reality just to name a few.

f) **Web-Based Training (WBT):**

Generally as web-based learning, e-learning uses streaming media, text, and graphics to develop exciting learning environment that is deployed right on the user via the internet. It is a great way to learning for the large group of people scattered across the globe, but it can present the same deployment challenge that the audience encounters in dial-up connecting.

g) **Computer-Based Training (CBT):**

This is great alternative to WBT for graphic or audio rich e-learning, deployed via CD-ROM, which elements the streaming issues that can be associated with BT.

h) **Synchronous and Asynchronous e-learning:**

With synchronous e-learning, learning and teaching takes place at the same time while the trainer and

learners are physically separated from each other. Examples of synchronous learning are as follows: Internet telephony, Web conferencing, online lectures, Distance learning via-interactive satellite and Audio/video conferencing. Asynchronous e-learning means that the user can take the training indent of any schedule. At Resource Bridge it refers to this as "wherever they are whenever they need it," asynchronous e-learning does not need a facilitator or instructor, and is one of the more popular e learning deployment methods. Examples of asynchronous e learning are the following: Self-paced courses taken via internet on CD-ROM and Stored audio/video level presentations or seminars.

13.10 SUGGESTED READINGS

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UNIT XIV DIGITAL STORYTELLING

Structure

14.1 Introduction

"Digital storytelling" is a relatively new term which describes the new practice of everyday people who use digital tools to tell their 'story'. Digital stories often present in compelling and emotionally engaging formats, and can be interactive.

The term "digital storytelling" can also cover a range of digital narratives (web-based stories, interactive stories, hypertexts, and narrative computer games); It is sometimes used to refer to film-making in general, and as of late, it has been used to describe advertising and promotion efforts by commercial and non-profit enterprises.

One can define digital storytelling as the process by which diverse peoples share their life stories and creative imaginings with others. This newer form of storytelling emerged with the advent of accessible media production techniques, hardware and software, including but not limited to digital cameras, digital voice recorders, iMovie, Windows Movie Maker, Final Cut Express and WeVideo. These new technologies allow individuals to share their stories over the Internet on YouTube, Vimeo, compact discs, podcasts, and other electronic distribution systems.

One can think of digital storytelling as the modern extension of the ancient art of storytelling, now interwoven with digitized still and moving images and sound. Thanks to new media and digital technologies, individuals can approach storytelling from unique perspectives. Many people use elaborate non-traditional story forms, such as non-linear and interactive narratives.[1]

Simply put, digital stories are multimedia presentations that combine a variety of communicative elements within a narrative structure. Media may include any combination of the following: text, images, video, audio, social media elements (like tweets), or interactive elements (like maps).

Digital stories may be used as an expressive medium within the classroom to integrate subject matter with extant knowledge and skills from across the curriculum. Students can work individually or collaboratively to produce their own digital stories. Once completed, these stories can easily be uploaded to the internet and can be made available to an international audience, depending on the topic and purpose of the project.

The implementation of educational technologies goes through a cultural shift among teachers who have responsibilities for the productive and effective implementation of technology in the teaching process [18]. "Preparing students to succeed in today's increasingly global economy and complex world requires a shift from a teacher-centric culture to learner-centered instruction" [19]. Teachers also need to help students to perceive "contextualized differences in identity, culture, and language usage before practical integration of storytelling" [10]. Apart from social and cultural differences, for an efficient implementation of technology in education, the interaction between the quality of the technology nature itself, the content of curricular instruction, and the pedagogy used for conveying technology should all be carefully considered [20]. The implementation of new technology involves a number of stages, beginning with basic and fundamental awareness, and creates functional dimensions of administrative policy and maintenance, which finally leads to positive outcomes [21]. The advent of the internet and new technology has offered unheard-of potentials for classrooms connections, but the recent dispersion of digital cameras offers educational and instructional opportunities as well. Digital storytelling can be simply defined as telling stories in electronic form by combining text, audio, video, photos, music, etc. It is the process of writing about a story with the help of multimedia elements of music, voice imagery in order to create a visual story. Traditionally, storytelling was a powerful and significant means of education. Digital storytelling takes the ancient and traditional part of oral storytelling and involves a set of technical tools in order to create personal stories using graphics, sounds, music, and images together to accompany the authors' voice [22]. As confirmed by the previous studies on DST, especially those reviewed in this paper, by integrating different types of multimedia, learners will be encouraged to tell even more fertile stories. By telling stories with the help of various types of new media, students learn how to deal with and manage information from various sources, and this enhances their communicative capabilities and information literacy. In addition, since in most cases digital storytelling can be done by learners in pairs or collaboratively in a small group, the students can strengthen and improve their collaboration and interpersonal communicative skills. By asking learners to gather information from various sources, instructors have the opportunity to get the students to explain and reflect the reasons why they made their selections, motivating them to become much

more critically mindful about the process of learning and their particular choices. Digital storytelling is a precise activity that stimulates, encourages, and values activities that learners are engaging in outside of educational organizations and schools. It asserts that their skills are valuable and significant and can be used in schools in their process learning. The process of DST provides a high quality and significant learning experience. The implementation of technology in the teaching-learning process represents a significant approach where it extends and promotes the learning experience beyond what could be fulfilled and attained without technology. It enhances the multimedia and visual literacy of students, and it provides learners with a competitive compelling voice by elaborating the boundaries of learners who can communicate with and by enhancing the power and depth of that communication. Many studies [3,23,24] have demonstrated that digital storytelling in fact goes far beyond the capability and functionality of traditional storytelling by generating and bringing in the learners' concentrations, interests, and motivation, facilitating learner collaboration, group work, and organization of ideas, assisting learners to apprehend sophisticated learning material, and presenting information in a meaningful and versatile manner. DST helps learners to recapture, improve, intensify, apply, and extend creativity during the learning process. It assists learners in writing creatively and more effectively by visualization of their writing, which results in an additional level of perception and authentic personal learning that enhances the writing process and effective learning experience.

14.2 Combining Text,Graphic and audio visuals to create a communication

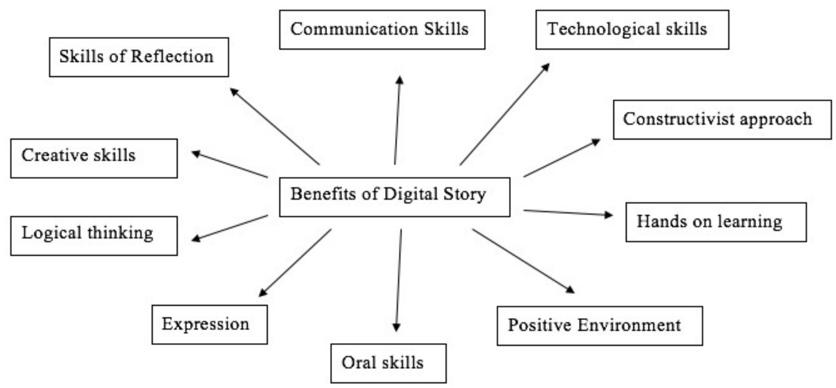
Combining text

Digital Stories are multimedia movies that combine photographs, video, animation, sound, music, text, and often a narrative voice. Digital stories may be used as an expressive medium within the classroom to integrate subject matter with extant knowledge and skills from across the curriculum.

1. **Start with an Idea –**
All stories begin with an idea. The idea could be anything and everything. Digital stories can be fictional or non-fictional.
2. **Write a Script –**
Once the idea has been conceived, make it concrete. Write a proposal, craft a paragraph, draw a mind map and prepare a draft for the script.
3. **Illustration and Painting –**
This is the stuff that makes the magic happen and writing come alive. This is where the transition into visual media takes place.
4. **Voice-acting –**
Giving the video a voice over makes it all the more effective. Expression through videos and pictures supplemented by voive acting makes the digital story impactful.
5. **Animation –**
Bringing the characters to life. Animation brings the digital story that is a fragment of our thought to reality.

6. Publishing –

Sharing online has become deeply embedded in our culture. So why not publish the story and share it online. Knowing that other people might see the work often raises motivation to make it the best possible work that one does.



14.3 Developing a story and scripting by combining multiple digital media

Digital storytelling combines the art of telling stories with a mixture of digital media, including text, pictures, recorded audio narration, music and video. These multimedia elements are blended together using computer software, to tell a story that usually revolves around a specific theme or topic and often contains a particular point of view. Most digital stories are relatively, short with a length of between 2 and 10 minutes, and are saved in a digital format that can be viewed on a computer or other device capable of playing video files. In addition, digital stories are typically uploaded to the interent where they may be viewed through any popular web browser. There are many different types of digital stories, but the author has proposed classifying the major types into the following three categories: 1) personal narratives - stories that contain accounts of significant incidents in one's life; 2) historical documentaries – stories that examine dramatic events that help us understand the past, and 3) stories that inform or instruct the viewer on a particular concept or practice (ROBIN, 2006). Digital storytelling has steadily grown in popularity and is currently being practiced in a myriad of locations, including schools, libraries, community centers, museums, medical and nursing schools, businesses and more. In educational settings, teachers and students from kindergarten through graduate school are creating digital stories on every topic imaginable, from art to zoology, and numerous content areas in between. Digital storytelling has also become a worldwide phenomenon, with practitioners from across the globe creating digital stories to integrate technology into the classroom, support language learning, facilitate discussion, increase social presence, and more (Co-Authors & Author, 2011).

14.4 Developing digital stories for communication in classrooms

How to tell students to tell a story Alexios Brailas Abstract: A design case study was used to investigate a unique means of introducing students to a digital storytelling assignment. The origin of this design case was the idea to use a digital story to present a digital story assignment. In this design case, we reflect on the design decisions that were made in light of the varied and unique requirements imposed by the particular educational context. We also illustrate the digital storytelling artifacts that were developed. Delivering (storytelling) the outline of an educational assignment in this isomorphic manner proved to be an effective means of communicating the nature and requirements of the storytelling.

Storytelling constitutes an organic part of human culture. In oral tribes, storytelling was the only available media for conveying all previously-accumulated knowledge to the next generations. In literal societies, storytelling keeps its salient role as an enculturation tool: as a vehicle to share cultural knowledge and cultural norms among human groups. Storytelling is an efficient way to foster a group's cohesion and increase a community's well-being: "American Indians and Alaska Natives have traditionally used stories and drawings to positively influence the well-being of their communities" (Montgomery et al., 2012, p. 1). Every culture develops its unique techniques and tools to use in a storytelling process (Frazel, 2010; Miller, 2013). In prehistoric times, cave paintings were used on cave walls to share and tell human stories, focusing mainly on themes about hunting

14.5 Evaluating digital stories

Since the main aim of this research is to investigate the impact of digital storytelling on student learning, the outcomes of this research will enable both teachers and students to tap into the power of digital storytelling, leading to more engaged teaching and learning. This study contributes to new understandings of how to create authentic and constructivist learning contexts that can be used in a range of educational settings. The research focuses on how to implement digital storytelling in the classroom, describing the digital story workshop, and explaining teacher roles and student tasks; i.e. this research gives a clear picture of how to integrate digital storytelling into schools. Therefore, it is expected that the new knowledge generated by this research will inform educational policy and practice.

14.5.1 Exploring possibilities for inclusive using digital story telling.

To record both qualitative and quantitative observations an observation tool was created (Additional file 1: Appendix B). This observation tool was adapted from WestEd ([2002]) to fit the purpose of this study. This tool contains three different forms:

Pre-observation form (qualitative)

Timed observation form (quantitative)

Field notes form (qualitative)

The pre-observation and field notes forms were used to collect qualitative data. The pre-observation form was used to collect information about the class being observed, objectives of the story, and materials used. Whereas the field notes form was used immediately after the class, to write up research notes.

The timed observation form was used to collect quantitative data about the use of new technologies. The timed interval observation sheet is divided into several components, analysed for the percentage of time each variable observed in the classroom. To collect data, the observer checks the presence of various attributes of technology integration observed during three-minute intervals. The check marks for the noted intervals are then tallied for an overall distribution of observed events (Sadik [2008]). This observation was conducted to examine the quality of student engagement in authentic learning tasks using digital storytelling, and specifically focuses on: class collaboration, knowledge gain, student roles, teacher roles, student engagement, technology integration and modes of learning.

Evaluation rubric

In addition to classroom observations, a scoring rubric was used by teachers to assess the quality of the digital stories created by the students. This stage had two different aims: to assess the level of student engagement, and document the educational outcomes achieved through digital storytelling. The level of engagement is a quantity that can be measured with the help of a scoring rubric. According to Sadik, it is appropriate to use an assessment instrument, such as a scoring rubric, to evaluate ICT-based learning projects (Sadik [2008]). Therefore, the role of digital storytelling was assessed by means of an evaluation rubric. An evaluation rubric created by the University of Houston ([2011]) was chosen as a guide to create the rubric for this research (Additional file 1: Appendix C). The evaluation rubric included nine criteria; these are: Purpose, Plot, Pacing of Narrative, Dramatic Question, Story Content, Grammar and Language Usage, Technological Competence, Emotional Content and Economy of Content. Four levels of descriptors were given for each category, with scores of 4, 3, 2, or 1 possible, depending on the level of success in that area.

Teacher interviews

Once the level of engagement was measured, we needed to ascertain the educational outcomes associated with digital storytelling. To perform this step qualitative data was collected through teacher interviews. After conducting interviews, the interview data were analysed to identify the benefits related to the use of digital storytelling

as a pedagogical approach, and the teacher's opinion about integrating new technologies in their curricula and classroom.

Therefore, three different methods were utilised for data collection: observation, teacher evaluation rubric, and interview. Timed observation and field notes were used as the observation method, while a scoring rubric instrument was used for teacher assessment. Finally, an interview protocol was used for interviewing the participating teachers. The overall conclusions will be extracted by integrating the findings of each method (Creswell [2008]).

Participant groups

This study involved five teachers from prioritised curriculum areas (Science, Art, English, Library and Social Studies) to integrate digital storytelling into the primary and secondary school curriculum during third and fourth terms in 2012.

Table 1 lists the details of each setting including the subject area in which the digital storytelling was implemented, the number of students, and days spent observing the project development, including viewing the digital story.

Table 1 Case study groups

Full size table

Implementation of digital storytelling in classrooms

Since the main aim of this research was to investigate the impact of digital storytelling on student learning when teachers and students use digital stories, and evaluate if and how digital storytelling could enhance student engagement and improve educational outcomes; the next section will focus on how digital storytelling is implemented in the classroom, describing the digital story workshop, and explaining the teachers' roles and students' tasks (Smeda et al. [2012]).

As mentioned by Sadik, the use of technology is only effective if the teachers have the expertise to customise the use of technology for story creation. The benefits can only be received if teachers have the ability to use it in the classroom effectively (Sadik [2008]). Therefore, the researcher started by giving an orientation seminar, followed by workshops to teachers during the first two weeks to support and engage them in the project.

The following steps were used to help teachers easily integrate digital storytelling in their classroom. It is not the only way to implement digital storytelling; however, it can provide clear strategies on how to integrate digital storytelling when teachers and their students do not have any previous training in digital storytelling (Ohler [2008]; Sadik [2008]; Miller [2009]; Kajder et al. [2005]; [University of Houston

2011]; Smeda et al. [2012]; Robin [2006]; Sharda [2005]; Lasica [2006]).

Teachers' workshop

Two workshops were conducted for the teachers with the following main objectives:

1.Introduce Digital Storytelling (Workshop 1):

Objective: Describe the concept of digital storytelling

Facilitator: Researcher

Description: The workshop started with a conversation about teachers' experiences with digital sound, video, and storytelling. An overview of possible strategies for using digital storytelling as a medium for engaging students and improving learning outcomes. The potential power of digital storytelling as a teaching and learning tool was then explored within the constructivist paradigm.

2.Introduce Moviemaker software (Workshop 2):

Objective: Describe how to create a digital story with the Moviemaker software

Facilitator: Researcher

Description: In this workshop Moviemaker software was introduced to the teacher with an explanation of how to create a digital story using this software; various features and options available in Moviemaker were demonstrated.

Students and teacher roles

Students at different levels have different skills and knowledge, so they need different levels of help. For example, primary school students who have basic skills and knowledge need more direction and guidance to create a digital story. Obviously, students in different grades might need different levels of assistance and scaffolding. Therefore, students worked under the supervision of their teachers, and depending on each individual student, teachers provided help in constructing and creating the story. It is expected that the level of teacher support and the extent of scaffolding may vary across levels; teachers were prepared to provide this support through a series workshops ([Smeda et al. 2012]).

Using the following lessons, teacher and student worked together to create the digital stories step-by-step:

Lesson 1: brainstorm

The objective of this lesson is to brainstorm the story. Typical expected duration is 1 to 3 days. In this lesson, teachers divide students into groups and allocate topics for them to discuss between themselves, share their ideas with each other and brainstorm the story in different ways. The students jot down ideas and write the initial narrative for the story for a particular topic the teacher had given them.

Lesson 2: storyboard

The purpose of this lesson is to create the storyboard. The estimated duration is 2 to 4 days. In this lesson, teachers help their students in writing the storyboard to organise the story sequences. They also help students clarify the main ideas of the story. Students, on the other hand, create the storyboard and select the right element(s) for it. They may also start by writing a draft of their storyboard. This assists in planning the visual materials in the right order, and thinking about how to match images or videos with the voiceover and music.

Lesson 3: search the material

This lesson is directed towards collecting the material required to create the digital story over a period of 2 to 4 days. Teachers demonstrate to their students how to look for images from different sources such as books, magazines, and the internet. They also explain copyright and digital rights issues related to the materials used. Furthermore, teachers show the students how to use the digital camera, if required. It is the students' responsibility to choose elements which match their digital story such as photos, videos, and music.

Lesson 4: creating the digital story

The objective is to use Moviemaker software for creating a digital story. Due to the amount of work associated, the duration of this lesson is 5 to 10 days, the longest among digital story creation steps. For teachers, this lesson is designed to help students create the digital story and explain how to import pictures and videos into the Moviemaker software. Moreover, teachers help the students who want to record their voices and use them within the story. The students created the digital story based on the storyboard by importing the elements to Moviemaker software and recording their voice to add to the narrative and test if it works effectively with the digital story. They can also add special effects and adjust the length of each visual element. This is achieved by choosing and adding some special effects, such as music and transitions, to make the story more

attractive, adjusting the length of each visual element to make sure it matches the narration, and this is done over the entire digital story.

Lesson 5: editing and feedback

This lesson is aimed at editing and finalising the digital story, after the student has created its first version. The duration of this lesson is 1 to 3 days. In this lesson teachers provide some feedback to incorporate further improvements before the final draft of the digital story. Students revise and edit the drafts based on teachers' comments and feedback. Then they discuss the final drafts with the teacher and other students. The final form of the story is prepared based on these comments and feedback.

Lesson 6: presentation and evaluation

The final step of digital story creation is about presenting and evaluating the finalised digital stories over 1 or 2 days. Teachers attend the student presentation and evaluate them based on story elements, story creation and presentation. The sole responsibility of the students in this lesson is to present the digital story to teachers, classmates, and parents.

Results and discussion

Individual case studies using mixed methods constitute the body of this research. Data for this study was collected through observations, the evaluation rubric, and teacher interviews. Five separate case reports were prepared. The case reports aim to answer the research questions; and a cross-case matrix was developed for each research question. The intent of the study was not comparative, due to the fact that it was conducted in a single school and all five practice case studies were conducted at different educational levels such as Years 3–4 in primary school, and Year 11 in secondary school. In addition, the approach assumed in the implementation of this research was dependent on teachers. Therefore, in one-class students worked autonomously, while in others they worked in groups.

Considering all the above parameters, the main focus of the research was not to perform a comparative analysis, but rather to evaluate the effects of digital storytelling on education. The intent was to capture the benefits of using digital storytelling to explore student engagement and outcomes, as well as teacher experience with digital storytelling.

Therefore, in this section will focus on the main conclusion derived from the discussion of main findings related to student's engagements and learning outcomes, as well as the teacher perceptions about digital storytelling as a pedagogical tool.

Enhancing engagement

The findings of this research indicate that levels of student engagement fluctuate between moderate and high. In other words, students were always engaged in the classroom. The use of software and conducting searches for digital media took these levels to very high, and were the highest for student presentations. In all cases students liked using technology, searching the internet, and watching other digital stories. There were some differences in implementation. For instance, Year 7 students had very low engagement levels when they had to complete their storyboards. Year 9 students had a constant, high level of engagement as they occasionally presented their completed works. Some Year 11 students' lack of interest in school curriculum presented as an engagement problem. However, the use of digital media managed to increase their engagement level. This finding is supported by Dupain and Maguire who argued that educators continuously need methods to engage students' interest with teaching material. With the aid of the latest developments in technology, classrooms welcome digital storytelling as a means of teaching, and students are motivated to conceive an academic concept and transmit their own (Dupain & Maguire [2005]).

The above findings are also in agreement with the current literature which encourages this new teaching approach, that is, digital storytelling permits students to utilise technology in an effective manner. Provision of appropriate resources and editing tools paves the way for student motivation and maximises its positive effect (Sadik [2008]; Morris [2011]). This encourages students to put more effort into their stories and to create quality products.

Yet another result confirming the above findings is reported by Gils, this research showed that pupils are more engaged with the practical environment. Digital storytelling makes practice and training more engaging, diverse, and customised to their needs and challenges, which makes it more realistic. In this sense, it encourages students to focus on using English to communicate with classmates. Digital storytelling has the advantage of engaging three different senses: hands, eyes and ears. It also increases students' technical literacy (Van Gils [2005]).

On the other hand, the findings of this research indicate students had a hard time getting engaged in the class when they had to finish their storyboard; some students were not interested in any school activity including digital storytelling. Therefore, they had a low engagement level. However, when these students started recording their own videos, engagement levels increased significantly.

Consequently, it is possible to use digital storytelling to integrate instructional messages with learning activities to create more engaging and exciting learning environments. This teaching approach enhances emotional interest and cognitive attention, and reflects consistent and reliable transfer of knowledge in line with modern learning theories. Considering Barrett's findings, it can be concluded that digital storytelling combines student engagement and effective integration of technology into instruction, which are student-centred learning strategies (Barrett [2006]).

Fostering collaboration

The findings of this research indicated that students work collaboratively and engage with digital content. They did more work while directly using applications and digital resources, such as the internet and/or libraries, instead of conventional printed media, such as books. This research also observed collaboration between groups where different groups helped each other with technical or grammar issues. This increased their levels of communication.

The above findings are in agreement with Standley who found that the creation of digital stories encourages collaboration between students, which in turn leads to the utilisation of various cognitive capabilities. Moreover, when working in a group, individuals pay more attention to content (Standley [2003]).

In addition, other researchers have found similar findings to those in this research. According to them, the digital learning experience can promote collaborative studying and encourages students to share resources online. Students' skills are also enhanced by using databases and internet sources. Furthermore, digital content ensures that different groups are helping each other, as networked digital content connects the whole class; students who participate in digital storytelling projects have better communication, organisational skills, and more confidence in terms of asking questions and expressing opinions (Robin [2006]; VanderArk and Schneider. [2012]; Hung et al. [2012]).

The fact that students helped one another in problem solution and concept development reinforces the idea that cooperation and collaboration levels are increased with digital storytelling, in other words students have a higher engagement level when they are working in groups to create a story.

In conclusion, this research demonstrates that digital storytelling can increase students' collaboration and communication skills.

Transforming learning

This research affirms that digital storytelling is suitable for a constructive approach to learning; because students work on their own story after receiving basic instructions from the teacher. Students have their own individual approach based on their interactions and experiences and generate novel outputs by using different sources in their creation of the digital story. These findings are in line with those reported by other researchers, such as Garrard who observed that digital storytelling supports constructivist learning

and concluded that digital storytelling is a good method of teaching with positive impacts (Garrard [2011]).

In addition, the findings of research conducted by Normann concur with this research. He concluded that digital storytelling is a perfect way of learning new things and to implement constructive approaches to education, he reported that the method of conducting lessons impacted the students' approach to learning activities (Normann [2011]).

The constructivist approach has several perspectives on learning since it recognises that human beings use their own personal vision in explaining the acquired information (Duffy et al. [2012]). This was supported by teachers in our study who concluded that digital storytelling permits students to learn by doing, and providing a flexible learning environment enables students to use their own ideas.

In addition, the findings of this research confirm that facilitating or scaffolding the learning process is the teacher's main role. At the beginning, tasks, software and digital storytelling are explained by the teacher, which requires a teacher-led mode. Following this step, students have the necessary knowledge from which to start working autonomously, with some teacher supported learning.

Robin, who has a similar outlook on digital storytelling, found that a story created by the teacher will help students to enhance their abilities. The teacher thus builds the framework for discussing storytelling topics and makes conceptual and/or abstract subjects more comprehensible. Building on experience and knowledge with teacher support, students create their own story using iMovie and/or Moviemaker. Thus students improve their skill set with teacher support in project development (Robin [2008]).

This has significant congruence with Miller's findings, i.e. students imitate interactions with their teacher and use these interactions to help others, thus building their interpersonal skills and confidence (Miller [2009]).

Building digital literacy

This research indicates that the utilisation of digital storytelling in education increases skills. Teachers witnessed that digital storytelling via technology integration assisted students, and helped them overcome their problems. As supported by Ohler, who viewed digital storytelling as a concept supporting creativity, students could solve crucial problems in unprecedented ways. Furthermore, teachers viewed digital storytelling as a valuable tool to increase research skills. A myriad of skills, such as spelling, writing, teamwork or collaborating with students and teachers, can be improved. Needless to say, the uptake of technology improves technical skills (Ohler [2008]). Sadik arrived at a different conclusion in his research, where classroom observations and interviews showed that the use of technology is only effective if teachers have the expertise to customise content for story creation (Sadik [2008]).

In addition, the findings of teacher interviews indicate that digital storytelling is an effective tool to help students improve their technical skills and information literacy. Students have the opportunity to choose the skill they want to work on and improve. This may include individual skills, such as spelling and writing, as well as interpersonal skills such as working in a team, or collaborating with students and teachers. Miller also found that in every class engaged in digital storytelling, one student acted like a tutor. This student not only worked on the project, but also provided technical support to peers in terms of developing their stories. In this sense, students are empowered to use their strongest skills, and improve them. Their research skills are also honed during video searches, scanning images and selecting audio content for the story (Miller [2009]).

Also, the findings indicated that teachers believe that the use of stories in education is very beneficial for countries receiving immigrants, such as Australia, because a digital story incorporates multiple aspects of the curriculum, and all teachers should use this medium at some stage. One teacher commented that in their school, where they work with many students from non-English-speaking countries, students welcome the opportunity to express themselves through visual media, rather than more words; it facilitates communication for new students and builds their confidence. Similar finding were reported by Benmayor who stated that digital storytelling can help learners to transfer their knowledge, skills and culture, thereby evolving their thinking process and helping them gain confidence. Accordingly, digital storytelling can be classified as an asset based pedagogy (Benmayor [2008]).

Additionally, the findings of teacher interviews indicated that, with digital storytelling, not only students but the teachers also got the opportunity to improve their technological skills. This included the use of electronic devices such as personal computers, cameras and recorders. Miller reported similar findings. She stated that digital storytelling is the best application for teachers to encourage students

to increase their use and knowledge of technology and technical skills. Furthermore, in order to create these stories, not only the students but also the teachers are obliged to increase their technical proficiency in using personal computers, digital cameras, recorders, etc. This helped teachers keep up with the latest technology (Miller [2009]).

Personalising learning experience

The findings of this research show that digital storytelling can cater for greater diversity by personalising student's experience. It can help them improve their confidence, and contribute to enhanced social and psychological skills. It can also be used to support students with special needs such as ESLa and VCALb students.

These findings are in line with other research outcomes reported in literature. Van Gils found that personalised education is one of the main advantages of digital storytelling. He argued that learners can present their experiences, reflections and evaluate their achievements while creating digital stories (Van Gils [2005]). According to Ohler, digital storytelling helped students to become active participants rather than passive consumers of information (Ohler [2008]).

Academic efforts that focus on the benefits of digital storytelling are supported by government agencies. Several governing and regulatory authorities have been working on improving the education system in terms of motivation, learning outcomes and professional integration. For instance, the Australian Curriculum in Victoria (AusVELS) was specifically designed to ensure that curriculum content and achievement standards established high expectations of all students (AusVELS [2013]). According to AusVELS students are expected to enrich their learning experience, not only in a single aspect of the curriculum, but in all areas. It is known that students in Australian classrooms have varying needs based on individual's learning histories, abilities, cultural and educational backgrounds. In recognition of this fact, the Australian Curriculum Assessment and Reporting Authority (ACARA) is developing additional curriculum to promote learning outcomes for students with disabilities, and/or to assist students from different linguistic and learning backgrounds (ACARA [2013]).

This fact is also recognised by the UNESCO program for the United Nations Decade of Education for Sustainable Development. It considers storytelling to be one of the modules which can be used to equip students with professional learning and teaching skills. This helps students achieve a wide range of knowledge, skills and values, which is the objective of Education for Sustainable Development (UNESCO [2010]). The use of storytelling in Australian schools is bound to have a

lasting impact, since it is defined by UNESCO as "a key teaching strategy for achieving the objectives of education for sustainable futures" .

Consequently, suffice to say that digital storytelling has, inter alia, the benefit of increasing student motivation, especially for those students who have difficulties with reading and writing, allowing personalisation of the learning experience, acquiring experience with in-depth and comprehensible reading and becoming more proficient at technical aspects of language. Digital storytelling can be used to develop personalised learning experiences for students, thereby responding to diverse individual needs.

Impact of digital storytelling on student outcomes

As the latest report for the Programme for International Student Assessment (PISA) indicated that the use of technology in education can increase various skills of learners, the findings of this research also suggested that digital storytelling can enhance several learning skills including writing, designs, library and research, technology and communication.

In addition, digital storytelling can help students with tasks they previously found very difficult including spelling, sentence formation and building, and forming the whole body of a text; this integration of technology assisted students to overcome their writing problems.

However, age and ability to learn technological subjects have some impact on the outcomes. When compared with primary school students, secondary school students have the ability to learn more and faster. They use the internet and computers more than primary school students. This was apparent during the study, especially where primary school students worked exclusively on their stories in the class, secondary school students worked on their stories, both inside and outside the class.

Furthermore, teachers observed that students were learning without realising. Provided that students are clearly informed about the task that is required of them, digital storytelling is useful as an all-round skill development tool; the use of digital storytelling can therefore reinforce various complementary skills.

Furthermore, age and ability to learn technological subjects have sme impact. When compared with primary school students, secondary school students have the ability to learn faster and learn more. They use the internet and computer more regularly than primary school students. This was apparent during the study where the primary school

students worked on their stories only in the class. On the other hand, secondary school students worked more regularly on their stories, both inside and outside the class.

It is observed that the subject does not impact student performance. However, the approach taken by the teacher proved to have significant impact. This was observed in two cases. In Years 3–4, the teacher observed that students were struggling with their writing and opted to introduce software so that the students had a clear idea about what was required of them. This additional step increased student performances.

In Year 7, the teacher asked the students to present their work when it was finished. Consequently, almost every fortnight there was a story presentation in class and this contributed to their engagement and better performance. Year 11, Victorian Certificate of Applied Learning (VCAL) students were a special case. There were two groups, one of which was working very well, while the other group was not interested in school work. Although digital storytelling created some interest in the second group, especially during video shoots and presentation, it was not easy to engage them with the overall task. They did not work on the story creation, required constant help from the teacher and received a very low mark.

The key to their success was that they spent more time in writing and editing their story with some help from the teacher, before actually starting the creation process. However, they did not perform as well in technological components, emotional content and economy of the story. Nor did they perform as well in the "Dramatic Question" and "Grammar and Language Usage" since their knowledge of English was limited.

Teacher perceptions about student learning through digital storytelling

Teachers had a positive attitude towards the use of digital storytelling as a teaching tool in their classrooms, as both students and teachers had the opportunity to improve their technological skills, which included the use of various electronic devices, as previously mentioned.

Teachers indicated that digital storytelling increased and enhanced the use of technology in the classroom, which helped students improve their technical skills and information literacy; digital storytelling can also be applied to subjects such as English and History, and in almost all the sciences including mathematics, social studies and humanities.

Furthermore, teachers confirmed that the use of digital stories in education is beneficial for countries receiving immigrants, such as Australia. The ability for expression through visual media, rather than words, facilitates communication for new students and builds their confidence. In addition, teachers fulfilled the role of facilitator, consultant, and could scaffold the learning process more effectively when they used digital storytelling in class.

Exploring possibilities for inclusive using digital story telling.

Digital Storytelling can also be a potent tool for students who are taught to create their own stories. After viewing example digital stories created by their teachers or other story developers, students may be given assignments in which they are first asked to research a topic and then choose a particular point of view. This type of activity can generate interest, attention and motivation for the "digital generation" students in today's classrooms. The process can capitalize on the creative talents of students as they begin to research and tell stories of their own as they learn to use the library and the Internet to research rich, deep content while analyzing and synthesizing a wide range of content. In addition, students who participate in the creation of digital stories may develop enhanced communications skills by learning to organize their ideas, ask questions, express opinions, and construct narratives. It also can help students as they learn to create stories for an audience, and present their ideas and knowledge in an individual and meaningful way.

In addition, when digital stories are published online, students have the opportunity to share their work with their peers and gain valuable experience in critiquing their own and other students' work, which can promote gains in emotional intelligence and social learning. Digital Storytelling appeals to students with diverse learning styles and can also foster collaboration when students are able to work in groups, and provides value in enhancing the student experience through personal ownership and accomplishment.

Check Your Progress

Notes: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of the unit.

1. Define the for communication in classrooms
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2. Define visuals to create a communication
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14.6 LET US SUM UP

In this unit you have learnt the concept of Digital storytelling

14.7 UNIT- END- EXERCISES

1. Define Evaluating of digital stories

14.8 ANSWER TO CHECK YOUR PROGRESS

Since the main aim of this research is to investigate the impact of digital storytelling on student learning, the outcomes of this research will enable both teachers and students to tap into the power of digital storytelling, leading to more engaged teaching and learning. This study contributes to new understandings of how to create authentic and constructivist learning contexts that can be used in a range of educational settings. The research focuses on how to implement digital storytelling in the classroom, describing the digital story workshop, and explaining teacher roles and student tasks; i.e. this research gives a clear picture of how to integrate digital storytelling into schools. Therefore, it is expected that the new knowledge generated by this research will inform educational policy and practice.

14.9 SUGGESTED READINGS

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